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THE TECHNOLOGICAL FUTURE OF THE INDUSTRIALIZED NATIONS AND THE QUALITY OF LIFE

Report from a North American-European Conference **Pont-à-Mousson, France, May 27 - June 2, 1973**

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These papers are circulated for the information of participants in the ecumenical enquiry on "The Future of Man and Society in a World of Science-Based Technology". Comments are welcome.

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I. INTRODUCTION

This number of *Anticipation* contains the report and selected papers of the North American-European Conference on 'The Technological Future of the Industrialized Nations and the Quality of Life' which met in Pont-à-Mousson, France, May 27 – June 2, 1973. The meeting, attended by 65 scientists, technologists, social scholars and theologians, was one of three regional conferences organized by the Department on Church and Society of the World Council of Churches as part of its five-year study programme on *The Future of Man and Society in a World of Science-Based Technology.**

The North American-European Conference was made possible with the help of the National Cathedral in Washington, D.C., and especially of Canon Michael Hamilton of its staff. It was co-chaired by Prof. Roger Shinn, Professor of Christian Social Ethics, Union Theological Seminary, New York City, and Mr. Max Kohnstamm, President of the Institute for University Studies of the European Community, Brussels.

The Conference considered three themes: (1) The Christian responsibility amidst the constantly growing knowledge of man over nature, (2) the technological options and possibilities for the future, and (3) the responsibility of the technologically developed countries to the less developed ones.

A group of European and American philosophers, theologians and historians participated in the first debate, among them: Prof. Max Geiger of the University of Basel; Prof. Jean Ladrière of the University of Louvain; Prof. A. Hunter Dupree of Brown University, USA; Dr. A.M. Klaus Müller of Braunschweig University, Germany; and Prof. Charles West of Princeton Theological Seminary, USA. A selection of the theological papers will be published in the next number of *Anticipation.*

The technological options were presented by three eminent scholars: Dr. E.F. Schumacher, former economic adviser to the British National Coal Board ('Small is Beautiful'); Dr. Alexander King, Director of the Science Policy Division of the OECD in Paris ('Growing Slowly is Preferable'); and Prof. Thomas Stelson, Dean of the School of Engineering, Georgia Institute of Technology ('All Things are Always Possible'). Three papers will appear in Study Encounter (no. 4, 1973) published by the World Council of Churches.

Other speakers examined these options from the standpoint of the business enterprise system and socialist societies. There were four participants from East European countries, including two speakers from Poland and Yugoslavia, representing Marxist views.

The Report reflects the discussion within the four working groups into which the Conference was divided. The Group dealing with Theological and Ethical Issues was chaired by Dr. Eduard Wildbolz of Berne, Switzerland; the Group on Political and Ideological Issues by Mrs. Pauline Marstrand of Sussex University, U.K.; the Group on the Challenge of the Third World by Prof. Frank Jones of the Massachusetts Institute of Technology, USA; and the Group examining Economic and Technological Options by Prof. John Coleman of Queens University, Canada.

In view of the relatively short time available for discussion in plenary it would be wrong to conclude that the findings reflect a complete consensus of the Conference, or indeed of the Working Groups. In some cases serious divergences of viewpoint have been noted in the text. The Report therefore represents not a final policy statement but a sketching out of problems and approaches to encourage American and European churches to increase their concern and involvement. It is a modest attempt to reflect systematically on a few burning problems. With that understanding the Report is forwarded to the churches and other interested persons in Europea and North America, and to the World Council of Churches.

The Conference greatly appreciated the reflections on biblical themes presented each morning during the Conference by Dr. Ellen Flesseman-van Leer, theologian and biblical scholar from the Netherlands, and requested that they be published as part of the record of the meeting.

Paul Abrecht

* See *Anticipation* no. 14 for Report on the Asian Conference.

II.

THE TECHNOLOGICAL FUTURE OF THE INDUSTRIALIZED NATIONS AND THE QUALITY OF LIFE

(Report of a North American-European Conference, Pont-à-Mousson, France, May 27 – June 2, 1973)

A. GOALS AND MECHANISMS FOR TECHNOLOGICAL PLANNING

We live in a world where the condition of human life is already determined to a great extent by technology. This situation has enormous potential for good, but also for evil. It is our responsibility to ensure that technology is used for good, that it is the servant of mankind. Technology can, by diminishing both material and spiritual poverty, contribute to a higher quality of life for all.

Every society must face problems of technological change. Such change must be submitted to the scrutiny of political and social groups; and, in the use of cost-benefit analysis for the assessment of the effects of technological change, it is essential that social considerations be a determining factor.

In the contemporary world technology is frequently associated with ideologies which are shaped by technology and in turn influence the uses of technology (see Part 2 below). It is important that these ideologies be subject to continuous scrutiny, because they include explicit and implicit criteria, such as efficiency, which do not necessarily improve the quality of life.

In practice the beneficial use of technology requires:

- the widest dissemination of knowledge concerning technology, its capabilities and risks;
- monitoring of technological processes to ensure that they do not escape human control;
- constant critical evaluation of specific types of technology to determine whether they continue to provide the benefits for which they were originally adopted;
- participation in the above processes by the widest possible section of the community to ensure that all points of view are heard.

1. Implications of Proportional Responsibility

Today the task of developing more human technologies implies a new understanding of the responsible use of the world's resources; hence it must be approached from a global perspective. This approach implies the principle of proportional responsibility; those countries which use the most resources or which use them most destructively have the greatest responsibility to compensate for the excesses and to make good the damage. This principle applies also to those who invent and first adopt new technologies which have harmful social consequences. The enforcement of such a principle would not necessarily require new international organizations, but rather new criteria for international cooperation.

The application of this principle would require that:

- decisions be made continuously on whether the 'benefits' of a technology in fact compensate for the 'costs' borne by the people affected;
- no national state should inflict injuries upon, or exact sacrifices from, the people of other states which it would not inflict upon or exact from its own people. On the contrary, in view of the current maldistribution and unbalanced consumption of world resources, and the world-wide effects of pollution, the governments of the developed countries have the duty to encourage greater sacrifices by their own people for the benefit of the poor and weak peoples of the world.

Some measures which could be taken by the developed countries to further responsible technological change and growth include:

- introduction of low tariffs for products of clean technology;
- institution of social and legal controls on advertising;
- more comprehensive international regulation of the transfer of technology from one nation to another, especially from developed to developing countries, and the ensuring that such transfers respect the freedom of decision of the receiving country;
- control of the multinational corporations – an issue which is being studied by the United Nations and other bodies; the churches can help to insure a critical examination of the issues;
- establishment of an international code of good conduct in resource management.

2. Technology and Ideology

The direction and 'quality' of the technological process are determined mainly by factors which do not reflect social interests, but obey the rules of efficiency and of productivity. There is a tendency, therefore, for technology to produce its own ideologies. Persons acting in a given technological field are in danger of being increasingly conditioned by the technical aspects of their functions. To guard against this tendency there needs to be a two-way exchange of opinion concerning the goals and methods of various forms of technology between the general public and those responsible for their implementation.

There is a widely recognized need for more centralized coordination of public action designed to safeguard community interests in the introduction of new technology. In many cases this must go beyond national boundaries. In an attempt to get a total understanding and control of the complex working of a modern technology, recourse has been made to systems analysis. However, the use of systems analysis as an aid to policy-making carries with it the danger involved in submitting social and political relations to the criteria of a purely technical approach. As the need for more public control of technological processes grows, there will be mounting demands for centralized planning. It must be pointed out that centralized planning increases the risks of misplanning and tends to concentrate power.

Some major issues require consideration within an ecumenical framework, e.g., the question of what social and political philosophy is to determine the use of technology, and the conflicts between the ideological systems existing within both developed and developing countries. The conflicts in ideological outlook and the suspicion that technology is used by developed countries to impose certain patterns of economic and social development upon developing countries are among the reasons for the meagerness of the progress which is made in encouraging world-wide sharing of technological know-how.

3. The Role of the Churches

The Church has an important role to play in offering a systematic and prophetic critique of the social and political implications of technological change. Thereby the Church can help in the continuous search for means of using technology in the building of a more human society. There are many opportunities today for churches to study and raise questions about government policy in this field and to petition governments to take under consideration new lines of public policy. Later sections of the report suggest some practical ways in which the churches might be able to fulfil their responsibilities.

B. SOME TECHNOLOGICAL OPTIONS AND DILEMMAS

There is sharp divergence of judgement among 'experts' about the imminence of resource constraints and about the probability that new technological breakthroughs in energy or food production may effectively forestall the overpopulation catastrophe. Even so, one of the reports of the 1972 Cardiff Conference concluded that 'we have entered a transition period during which decisions must be taken and implemented concerning a major redirection of our technology, particularly that relating to resource consumption'.*

* "Towards an Ethic of Natural Resource Use", *Anticipation*, December 1972, p. 9.

The Pont-à-Mousson Conference accepted this conclusion and attempted, in a tentative manner, to initiate the formulation of such decisions. Christian faith requires and gives guidance for the effort. In the Genesis account of Creation God views his work and —declares that it is good. He made man and gave him dominion over the lower creation. It is largely through sciejce and technology, viewed in its broadest scope, that this dominion is exercised. It is clear that man has misused his power in ruthless and selfish exploitation of nature. The Christian must recognize that the earth is the Lord's and that man is a steward responsible to God for his use and abuse of nature. The meaning of this in terms of man's approach to nature must be spelled out by the churches.

Further, social justice demands that the wealth and energy of the world be divided among men more fairly than at present. It is therefore the duty of individual Christians and of Christian Churches to work locally, nationally and internationally to ensure that government and social policies be redirected to reduce the economic gap between the developing and the developed nations. Further, technological research should be energetically pursued to facilitate this process, and to conserve non-renewable resources.

The industrialized nations must be persuaded at all levels from government to individual to reduce rates of consumption of threatened resources. This must be accompanied by an improvement in the condition of the poor in all countries, possibly achieved through new forms of resource-conserving growth in developed countries coupled with new patterns of income distribution. Such reduction in resource consumption will increase the probability of human survival and allow a more just distribution of world resources among the nations. Advocacy of a conservation ethic will not always be sufficient in itself. Every attempt must be made to identify specific cases where a substantial reduction can be achieved through currently available technologies. When such reduction cannot be achieved through the current market mechanism, governments should use economic incentives or appropriate legislature, together with directly funded research programmes to expedite the introduction of resource-conserving practices.

During the brief time at our disposal it was possible merely to approach in a sketchy manner some of the areas in which hard decisions must be taken. We did not feel sufficiently competent nor did we have time for an in-depth discussion; so the following views are not set forth in a dogmatic spirit. They represent our best judgement, and are offered as illustrations of the sort of issues to which we believe Christians should be giving serious consideration.

1. Energy and Oil

Currently the industrialized nations are highly dependent on fossil fuels, particularly oil, as a source of energy. Many of the hopes of the technological optimists for a progressive and unlimited improvement in the average lot of mankind are contingent on the availability of an expanding supply of energy. Since the supply of fossil fuels is finite (the end of their supply may already be in sight) it is widely held that we must turn to nuclear reactors as our main source of energy. The conference was divided on the question as to whether or not the known dangers associated with radioactive wastes and possible heating of the atmosphere attendant upon a large use of nuclear reactors might effectively bar this as a long-term source of energy in the amounts needed for the realization of the technological optimist's paradise. More information is urgently needed on this question.

However, there was agreement that it is desirable to curtail and, if possible, eliminate the use of gasoline for private automobiles in the industrialized nations. For this to be politically possible in the near future, some new form of power for automobiles will be required.

2. Economic Considerations and Their Limits

In many countries there are still strong pressures to decide questions involving human and material resources almost solely on the basis of economic considerations. As human beings and Christians we reject this method as too narrow. Economic measures are necessary but not sufficient. They capture only part of reality and do not include its more important human and social aspects. Also the careless use of averages in social and economic measurements often obscure significant differences within the group studied. No technical or political decisions should be taken without due consideration of their broader human meanings.

While we speak in conventional terms of 'developed' countries, there is a sense in which some countries may be considered as *overdeveloped;* they consume a disproportionate share of the world's finite resources including proteins,

fossil fuels and minerals. Christian faith commands us to work towards the realization of distributive justice inside each nation and between nations. We know that the route towards this goal will be slow and oft-times frustrating. But the aim must be to limit the consumption by each overdeveloped country to a fair share of the world's resources. Here we present some guidelines for political and economic decisions in these countries.

Social efforts may include:

- limitation of consumption by changes in the tax structure, by rationing, by placing an upper bound on income, or by other means;
- research on the social changes necessary to achieve a society with reduced material consumption;
- research on ways to serve the needs of developing countries while avoiding the sins of both economic and cultural imperialism.

Individual efforts may include:

- political activities to accomplish the changes listed above;
- limitation of personal expenditures and the use of money saved for (a) support of progressive political activities, (b) education of young people in the questions involved, (c) relief, (d) sponsoring of research.

3. Some Elements of a Policy for Technology

(a) Increased research and development

As non-renewable resources are depleted and energy sources consumed, government structures must be capable of adapting to the changing conditions. National and international expenditures directed toward increased production of material goods by current technology should decrease, while expenditures directed toward improved services and new technology that conserves resources should increase. Government structures to implement such changes in technology are necessary. Any research programmes to develop these new technologies should assess their overall social as well as technical aspects. A variety of alternative schemes should be formulated and publicly evaluated before implementation. Several diverse schemes adapted to local needs and conditions are preferable to a single system, provided costs are not significantly increased.

As an example, consider the development of new energy sources. Instead of blindly searching for additional oil to extract at great expense, the alternatives of nuclear, geothermal, solar and fusion energy sources should be comprehensively studied and developed, so that a more responsible resource conserving pattern could evolve.

A much greater emphasis should be placed on the development of sciences and technology for public benefit, leading to the initiation of programmes and their control by public bodies. In order that the public can properly assess and influence technological development, people must have access to adequate accurate information. Such information might describe the environmental impact (pollution and drain on resources), influence on employment, safety, economic and production characteristics of any proposal.

The scope of research should encompass service technology as well as production. Progressive educational systems, medical delivery technology, communications and biological implants are examples of such low resource, high service technology. These research efforts should aim to increase the carrying capacity of the earth, improve the standard of living of the peoples, and move toward peace and better distributive justice.

(b) International cooperation in research and development

To provide greater diversity, faster response and more effective development toward common global goals, a comprehensive programme of 'technology transfer' should be evolved. Many aspects of research and development are of international value. Information exchange and a common data bank whether through an extensive publication system or other means would accelerate progress in conserving resources and improving technology. Countries without extensive research and development programmes would then have access to total world brain power.

A balanced programme for developing both large and small technology should be maintained. The small technology is more likely to be needlessly duplicated and the information exchange would increase benefits. The development of large and expensive technology would more likely require international cooperation. For example, sedimentation studies in India have saved much time and effort in the development of irrigation systems in other countries, including the United States, whike the U.S., Soviet Union and others are cooperating in space research.

(c) Waste and recycling – an introduction to the problem

The damaging effects of man's activities on his environment have been recognized since antiquity.* These effects have manifested themselves in many ways – for example, air and waste pollution, destruction of species, and depletion of resources – in fact, most of the same things about which we are concerned today. But there is one important difference between the situations created in the past by these problems and the situation which confronts us now, a difference which is indicated by our use of the plural 'situations' to refer to the past and of the singular 'situation' to refer to the present. This difference arises from the rapid growth of population, of technological and scientific achievement, of industrialization, and of contact and communication between all parts of the world. A consequence has been a 20th century sandwich – global economic depression between two world wars. Thus we know better than in past epochs that 'no man is an island, entire of itself', but that 'every man is a piece of the continent, a part of the main' (John Donne).

This awareness has become particularly apparent in relation to the use of the material resources of the earth. Two examples – copper and petroleum – illustrate the point. The known global reserves of these two commodities will, at the present rate of usage, last only another 36 and 31 years respectively.* And it is likely that the usage rates will increase. Thus we are faced with the problem of limited resources.

In addition, these resources are often being used in an inefficient manner, leading to an aggravation of the pollution problem and the consequent deterioration of the quality of the environment, especially in North America and Western Europe. And, even more serious, there is widespread dispersal and dilution of the resources so that they become virtually irrecoverable, at least without the expenditure of large quantities of energy.

Thus, what is needed to alleviate this problem in addition to continued research to uncover new raw materials and to find better methods of using them, is:

(a) recovery of waste materials for re-use in their original form, or,

(b) recovery of waste for use as raw materials for other processes.

The Complexity of the Problem

Waste materials are of various kinds. Corrosive gases poison the atmosphere. Crude sewage and solutions of organic materials from industries (such as paper-making and antibiotics production) foul our rivers and oceans. Dumped mineral wastes disfigure our towns and countryside.

The problem is not an easy one. However industry and government are already working on the recovery of waste gases. The recovery of substances from liquid wastes is more complex, as indicated by the simplified diagram. (Chart 1) There is indeed no single solution, and each class of waste material will have to be considered separately, because:

(a) many substances occur in very high dilution;

(b) some liquids contain many different components;

(c) wastes are often produced at great distances from suitable treatment centres, and costs of transportation may be very high;

(d) water itself is a valuable commodity, often in short supply.

Solid wastes present the most difficult problem of all. For example, metal scrap often contains small quantities of scarce metals that are difficult to recover; mineral wastes are generally produced in vast quantities; and waste plastic material is almost indestructible.

* Exodus 7:17-24. This description of the Nile becoming foul and undrinkable and of fish dying is an early account of the effects of pollution.

* U.S. Bureau of Mines, 'Mineral Facts and Problems', 1970.

Possible Solutions to the Problem

Nevertheless some of these problems have been solved, and the 'know-how' can be communicated more widely. In the U.K., for example, sewage plants are producing potable water, valuable fertilizer, and enough gas to provide the energy required to operate the plant. Again, old coal tips have been contoured to match the surrounding countryside. And much scrap iron is returned to the blast furnaces and glass bottles to the glass factories,

However, new technologies are needed for many recycling problems. The recovery of scarce metals needs to be made economic. The problem of biodegradation of plastic packaging and containers needs to be solved. The combination of different types of residues and their fermentation with suitable microorganisms to give useful products – solvants, methane gas and protein for animal foodstuffs – should be studied.

Under present-day conditions, the recycling of waste, though especially desirable, is not necessarily economically viable; legal and fiscal measures will almost certainly be required to provide the necessary stimulus for such developments.

The undertaking of these tasks is an urgent necessity, probably for human survival, certainly for a desirable quality of life. It is especially a responsibility for all who believe that 'the earth is the Lord's and the fullness thereof' (Ps. 24:1). Christians rejoice in this earth as God's creation and God's gift to his children, who are called to dominion and stewardship and to the sharing of it with each other.

C. TOWARDS A GLOBAL PERSPECTIVE – THE CHALLENGE OF THE TWO-THIRDS WORLD

The industrialized and technologically developed countries are for the peoples of the Third World paradoxically a hope and a burden. A hope because they can through their immense and constantly expanding technological capacity help to relieve the poverty of nations; a burden because so much of this technological and economic power is used today to control and exploit the poorer countries. Further, the developed countries consume far more than their share of the earth's resources. It is estimated that the USA with less than 6% of the world's population consumes about 40% of the world's annual output. In the decade 1959-68 the American people used more of the resources of the world than all the people of the earth consumed in all previous history. It is estimated that one American draws on resources that would sustain 50 Indians.* (For Europe the figure is roughly 1 to 25).

These facts are indications of the existing inequalities between rich and poor in the world. As Christians we cannot accept this situation. It is our faith that all men are created and loved by God and are therefore equal. The God of the prophets and Jesus Christ allies and identifies Himself with those who are poor and marginal in society. Hence we regard the obligation to promote a just distribution of the world's resources as a basic principle in a Christian political ethics. Social justice should therefore be one of the main criteria for planning technological development in the future society. Our task as Christians should be to discover how the resources of modern technology can be used to bridge the existing gaps between classes, people and nations.

Christians in Africa and Asia* are asking questions about the future of the technologically and industrially developed countries as it threatens their own future. They are pressing for new definitions of technological responsibility in a global perspective, and they are demanding a larger share of the fruits of modern scientific and technological discovery. This concern involved Christians in North America and Europe in a radical re-appraisal of their own technological future.

Today governments and peoples whether in Moscow, Prague, Warsaw, London, Essen or Chicago, feel the impact of the technological environmental crisis and all that it entails, from pollution to a new sense of social alienation. This crisis has added to the malaise of the industrialized countries and started them on the search for new models of society. It is not clear, however, that the developed countries see their technological crisis in a global perspective. A true perspective on these problems must involve a consideration of the way in which they impinge on the developing countries.

* S.L. Parmar, "The Environment and Growth Debate in Asian Perspective", Paper for the Kuala Lumpur Conference, April 1973.

* See reports of the WCC-sponsored *West African Church Conference on Science, Technology and the Future of Man and Scoeity*, March 24-30, 1972, and the *East Asian Christian Conference on the Scientific, Technological and Social Revolution in Asian Perspective*, Kuala Lumpur, April 17-23, 1973.

1. The Demand of the Developing Countries for Self-Reliance

Two statements, one from Africa and one from Asia, illustrate the demand of the developing countries for freedom from the technological and economic power of the developed countries:

> 'We are agreed that self-reliance is the appropriate ideology for Africa. It is an ideology intended to permit African states to achieve economic independence by relying upon and mobilizing their own resources, reducing dependence on aid from developed nations, and increasing the volume of trade with other parts of the world. For the individual, self-reliance does not mean affluence. It means that everybody has the basic necessities of life and work – good food, housing, education, etc. – and works for his living without exploiting others or being a parasite on them.'
> *(West African Church Conference on Science, Technology and the Future of Man and Society, p. 42.)*

> 'Here (referring to Gandhi's example of village industries) was an example of self-reliance becoming the most important economic and political capital for Indian society. Our current disposition towards self-reliance should not look upon it as a technique but as a value which governs and shapes socio-economic structures. The debate on environment and growth highlights the existence of a 'poverty of affluence'. Why should we get enamoured of a new kind of poverty when we have still to overcome the old?'
> *(From address of Prof. Parmar to Asian Conference.)*

Christians in the Third World feel the need for a self-reliant society because they want a development which includes not only economic growth but also social justice. They do not want to imitate the political and economic model of the industrialized countries, which has as its primary aim economic expansion. They have seen also in their own societies the negative consequences of the social system of the industrial countries. They recognize that the present international trade system has helped to produce the widening gap between the poor and the rich in the world. Furthermore, the present limits to growth discussion points to serious weaknesses in the pattern of production, consumption and technological growth of industrialized nations. In this situation, they want to find a new model of their own for the society of the future.

We support those in the Third World who want to find an authentic model for the future, and we ask Christians in Europe and North America to cooperate with this legitimate movement for self-reliance by:

- encouraging an exchange of technical and scientific experience, based on this new relationship;
- working with the peoples of the developing countries in formulating criteria for technological and economic cooperation;
- encouraging direct contacts with movements of peoples' participation in the Third World;
- challenging the behaviour of business organizations like the multi-national cooperations, when they operate within the developing countries in ways contrary to social justice and self-reliance.

Need for a Continuing Dialogue about Self-Reliance

While acknowledging the validity of this concept of self-reliance we recommended that there be continuing dialogue on its assumptions. In this spirit we would raise these questions with the developing countries:

1. Does the acceptance of the idea of self-reliance mean that *all* economic aid and technical assistance become suspect? What types of aid best strengthen self-reliance?

2. Is a clear distinction made between self-reliance as a cultural idea and its implications in economic and social life?

3. How are the initiatives of churches, progressive political parties and action groups which seek to improve relations with developing countries to be evaluated, and how is an interpretation of self-reliance which limits relationships of this kind to be avoided?

4. When you speak of economic self-reliance, do you mean that you wish to increase your trade with rich countries and thus become economically stronger and less dependent, or to increase your trade with the other developing

countries because you fear that all relations with the rich countries limit your independence? (We understand that for you reliance does not imply withdrawal, isolation and autarchy.)

2. Cooperation Between the Developed and the Developing Countries in Promoting the Right Use of Science and Technology

We strongly regret that most of the Western countries have adhered only verbally to the programme for the Second United Nations Development Decade. These proposals relate to

(1) widening of the markets of the rich countries for industrialized products of the poor countries;

(2) avoiding substitutions of synthetics for natural products;

(3) accepting world-wide commodity agreements;

(4) accepting the 0.7% as the minimal proposal for official aid in 1975;

(5) accepting the idea of a new division of labour on a world-wide basis.

We remind both the governments and the churches of the Western World of the resolution adopted at the Geneva Conference on Church and Society in 1966 and the Fourth Assembly of the WCC in 1968, favouring sacrificial action by their nations in support of development of the poorer nations. In the Third World, as well as among many people of our own countries, there is a growing agony and frustration related to the rejection of a new world-wide responsibility by the industrialized countries.

Millions of migrant workers, coming mainly from underdeveloped regions of the Mediterranean countries but also from Asia and Africa are on the move in Western Europe, especially in the framework of the European Economic Community (EEC) where rapid economic growth is an irresistible attraction. On one side, this migration of labour brings monetary relief to the communities of origin. But on the other side, the causes of unemployment are not overcome by migration. In the long term, the economic structures of the developed countries have to be changed in such a way that they will not continue to be dependent on labour forces from the poorer countries, which must rather be assisted in developing their own economies.

The Western countries must not discourage such development in the poorer areas through subsidizing their own marginal industries and branches of industry; it is exactly in these marginal industries that at least part of the migrant workers have found employment.

The internal economic policy of the European Community and particularly its agricultural policy, must be criticized and changed to promote world-wide economic development.

WE STRONGLY URGE THE EUROPEAN CHURCHES to act as a watchdog to ensure a well-balanced policy which is in the interests of the people of the Third World (and not for only those African countries which at the moment are the only non-European countries in association with the EEC), and the peoples of their own countries. We also strongly urge that both the European churches and the North American churches fulfil the call of the Uppsala Assembly to re-educate their members to adopt a world perspective on development areas.

In present-day society, science and technology play an all pervasive role. Although the causal relation between the effort put into science and technology and the rate of economic growth may not be as strong as some believe, it can safely be assumed that a fully developed indigenous scientific and technological capacity is needed to meet the present needs of any society. At the same time, the example of the technologically highly developed countries demonstrates that the possession of this capacity does not lead automatically to social justice and the fulfilment of the basic needs of the people.

As was stated at the West African Church Conference and the East Asian Christian Conference, the developing countries do not have the capacity in science and technology to fulfil their aspirations and solve their problems, and react adequately to challenges posed by the outside world. Consequently they are not free to set out on a self-determined course.

It is therefore the task of all countries that are cooperating to bring about social justice to help build up indigenous scientific and technological capacities in the developing countries.

The U.N., recognizing this need, appointed the Advisory Committee on the Application of Science and Technology to Development. This Committee in the detailed recommendations of its 'World Plan of Action':

- outlines priority areas for research and areas for the application of existing knowledge;
- indicates the way a capacity for science and technology should be set up in the developing countries, and
- sets quantified targets for the Second Development Decade in terms of financial resources to be devoted to this effort.

The United Nations General Assembly has adopted most of these recommendations.

WE RECOMMEND that the churches in the industrialized world:

- stimulate study groups to provide insights on the role of science and technology in promoting social justice;
- stress the duty of governments and agencies of the developed countries to meet the quantified targets of the World Plan of Action;
- stress the care with which transfer of science and technology should take place, i.e. oppose duplication of Western technology which mostly benefits the rich and results in the uprooting of communities;
- encourage scientists and technologists to design a human-scale technology, responding to local needs and using local manpower and natural resources.

3. The Limits-to-Growth Debate in World Perspective

In the context of the Limits-to-Growth debate, it must be stressed that:

(1) at the present moment the concept of retarding growth is valid only for the rich countries;

(2) the poor countries need economic growth, accompanied by social justice and self-reliance;

(3) as the rich countries change their patterns of production and consumption, there will be a strong need for deliberations with the countries of the Third World, because this change could have a strong impact on their economies.

The choice of the economic instruments to be used to limit growth is of great importance for the nations of the Third World. Consider some of the relevant questions of economic policy: Should we put a ceiling on the incomes of citizens of the Western countries? How can we restrict the growth of industry and agriculture? Can we use the free-market mechanism for the distribution of scarce resources? Such questions must be seen in the perspective of both the world ecological crisis and the poverty of the developing countries. The burdens that accompany changes in the patterns of growth and production in the developed countries must be shared by those who are now well-off – not merely shifted from the disadvantaged groups of one society to those of another. Adjustment, support and training must be provided for these groups most affected by the changes.

CONCLUSION

We call for a reduction in the use of the world's natural resources by our industrialized societies, even though this entails reduction in material economic growth.

There is already enough evidence to indicate that our material growth must cease.* This will involve

- *Firstly,* a reduction of consumption of material goods by individuals in our societies.
- *Secondly,* and simultaneously, a change in the patterns of production in order to conserve resources and energy, and to fit environmental constraints.
- *Thirdly,* a new ethic of sharing to replace our acquisitiveness. In practice, this means promoting a fuller use of the world's natural resources by developing nations, as well as by the less privileged groups in the industrialized societies.

* We are not entirely agreed on all issues involved in this statement. Some of us expect technological breakthroughs that will expand productive possibilities; others of us think it risky to count on such breakthroughs. We all agree that economic growth does not produce justice.

OTHER RECOMMENDATIONS:

1. The churches of the developed nations should encourage discussion between nations about cultural, ideological and religious assumptions underlying new patterns of human living, in particular about a moral basis of social patterns of technological society.

2. The churches should promote an educational programme to enlighten the people of the developed countries on relations with the Third World. In this programme they should cooperate with schools, trade unions, employer organizations and other interested groups. The governments should accept some financial responsibility for these programmes for development education.

3. Western educators should encourage the instruction of Third World students in a technology and science that is suited to the needs of their particular societies. Special care should be taken to ensure that technology and science courses do not include an indoctrination in Western culture. Special teaching programmes should be devised for students of the Third World in the basic concepts of science and technology; these programmes should be integrated with the cultural backgrounds of the students and geared to the needs of the developing countries. This can be done only if both staff and students take as a starting point research problems which are intimately connected with the situation of those countries.

4. Concluding Note on a Responsible Technologically Developed Society

Our acceptance in this report of the demands of the Third World for self-reliance signifies that we are also willing to accept a critical re-examination of the present economic and political system in our own societies. Within the ecumenical movement, since Amsterdam 1948, the concept of "a responsible society" has been taken as a basic social ethical criterion. It implies that we should promote democratic political and economic structures, because man is a creative being, made in the image of God and called to cooperate with him in creation. This means that participation in *all* decision-making processes belongs to a good and fully human life. It is especially important that not only the experts but also the masses of the people should be able to influence the planning of the future and of technological development.

A new basic element in the responsible technological society of the future is that it promotes not only economic growth but also the "quality of life". A good human life depends not only on material welfare but on a good environment, health, self-dependance and meaningful work. It seems obvious that the present model in the industrialized countries gives too high a priority to material welfare and economic growth. These models lack mechanisms for promoting such values as environment – including the industrial environment – and participation of the workers in economic decisions. If we are to change this situation we will need a certain kind of planning of the economy and of technological development.

The moral principle of justice must have priority. Justice means neither a "principle of merit", i.e. distribution in proportion to a certain meritorious behaviour (intelligence, thrift), nor a "principle of objective equality", i.e. a distribution whereby everyone attains an exactly equal amount of good life. It means a *principle of needs,* i.e. a distribution whereby all people are accorded an equal means of realizing a maximum of good in their lives in relation to their capacities and particular requirements. This principle should be a criterion both for our planning of technology and for production in our societies. Our production does not promote justice when its aim is to satisfy our *wants* (cars, colour TV's, and other luxury goods) while at the same time the most basic *needs* of great numbers of people in the world are not satisfied.

D. SOME THEOLOGICAL ISSUES: CHRISTIAN FAITH, THE QUALITY OF LIFE AND THE FUTURE

We here address explicitly two questions that are implicit in Sections A – C above.

1. How does a Christian understanding of the quality of life under the promise and judgement of God relate to the quality being produced by modern technological developments?

What follows is not an effort to answer this question. Rather it is a report on the meaning of the question itself and the various lines along which an answer might be sought, as these emerged in our discussion. Some of these lines are complementary. Some stand in sharp opposition to each other. They indicate, however, where we believe the issues lie, first as to method, and second as to content.

a. Method: How Christians proceed to face the problem

A spectrum of possibilities appeared in our debate. One opinion, strongly represented among us, holds that the starting point for any Christian engagement with economic and technological systems is within those systems themselves. We are all technologists; we are economic persons. All the problems of making those systems work are also ours. There is no possibility for a Christian to withdraw altogether. There may be forms of asceticism seen as prophetic signs, but not as a means of dealing with modern problems. Our participation in transcendence consists in seeing these systems under the sign of a hope which they cannot give themselves. We discern in them the working of the redeeming grace of God, often in spite of their apparent self-destructive tendencies and inhuman directions. This grace carries with it a message of creative change which may go through the death of existing institutions toward new forms and new organizations. Such an interpretation requires a theology of the cross balanced with discernment of the power of the resurrection. This makes it possible to see an evolutionary pattern in the systems of this world, by grace, toward justice, freedom and democracy.

At the other end of the spectrum a contrasting opinion holds that the processes and structures of modern technological society are the result of a sinful human response to the promise of God for man. Theological errors as well as theological insights have gone into its formation. Transcendence therefore means freedom from the particular models of life which this technological world hands us, and from its way of putting the questions we must solve. Christians have the task of bringing forth new models of the humane use of technology, new visions of the common life, which will take society in new directions before it destroys itself by following its own impulses and the logic of its own systems. We need a theological analysis of technology which will produce this result, while we participate in its processes. We need to work out new goals and values from theological bases.

Whether we find ourselves at one end of the spectrum or the other, or at some intermediate point, we must recognize the theological importance of contingency in the future of man and the universe. Our faith tells us that God set man free, that man has the possibility of choice, that there are no developments by pure necessity. This notion may not be confused with an irresponsible approach to concrete problems. It does not mean that we are allowed to initiate concrete problems. It does not mean that we are allowed to initiate lightly developments which may be dangerous. The creative contingency of the universe liberates us from determinism but at the same time emphasizes human responsibility for the whole earth in its present and future.

At this point the question of continuity and change in theology itself arises. There is a sense in which the relation between man and God, as the biblical history tells it, does not change. Theology has reference to this constant faithfulness of God and to the continuing problems of human sin and promise of salvation. But we face the task of understanding this relation anew for our society in the midst of its technological development, of making the biblical story relevant for our time.

We also face the problem of communicating the human goals and values, the human hopes and possibilities, which a good theology suggests to a society dominated by the concepts and methods of various technologies and social sciences. Human values are not reducible to economic measurements, nor are they dependent on technological determinants of human life. But Christians have to insist on the central importance of relative choices between conflicting goods, and they have to doubt all solutions to human problems which do not result from a thorough and serious reflection on the complex phenomena of social and individual life. There remains a tension, but we must live with it in order to redeem economics and technology themselves, and to have an influence on actual decisions about man in society.

For some participants the quantification of essentially qualitative human values was advocated as a means of establishing priorities between relative choices and as a means of drawing economists and technologists into the ethical dialogue. Others from different backgrounds found this to be a danger.

b. Content: What might be a Christian style of life?

When, by these methods, we turn to discerning and describing a quality of life which in modern society might be a response to the promise of God, we are faced immediately with one basic theological task: the relation between man and his physical environment (nature) must be reconceived. For centuries nature has symbolized the essence (usually unchanging) of things. Its laws have been understood as the basic structure of God's creation, of being itself. They have been the framework in which human history and life have been understood. Today, however, a basic ontological shift has taken place: nature has become subject to the operations of human science and technology. Instead of discovering it, man is more and more making the reality which surrounds his life. The physical environment is being planned for human purposes. Man has the freedom to use or destroy it. This is the new limit man faces. By his sinful use of God-given power he may render unfit to support true human life the environment God has provided and given to his care.

We do not enter here into the historical argument as to how far Christian and Jewish doctrines of the role of man before God in creation have been responsible for the development of this state of affairs. There can be little doubt that Christians and churches have been guilty with others of misusing their stewardship of God's creation, of turning technological knowledge and power to their own selfish ends, and of brushing aside the just claims of the poor to freedom and a fair share therein. It is we who must first repent. But we know a God whose mercy is stronger than our sin. Living by his grace, not the virtue of our own actions and opinions, we must address technological power theologically, drawing on the sources of our faith.

First, the physical world – nature – like man himself, is the creation of God, who is constant and faithful in all his works. Its value and purpose must be understood from this fact. It has its place in the work of God as we know that work in the history of his covenant with Israel and in Jesus Christ. Nature is given to man by God as his environment, and man is himself physical and fleshly. In Christ God himself became physical reality to bring man salvation here. The physical world, like man himself, belongs to God. God's activity is reflected in it as well as in human life, history and destiny. This is the source of its value and the respect due it.

Second, man is called to exercise dominion over the physical world not to satisfy his own lusts or ambitions, but in order to bring forth its fruits as a part of realizing the promise of God. Man's power over nature is that of a steward who is himself totally responsible to God for it. Nature participates in human history. Man's sin can despoil it, and its destitution stands in judgement of man. But man is made to be a partner with God in the ongoing creative use of nature, so that man and his physical environment move together toward the fulfilment God intends for them both.

Third, it is man, not nature, who is made in the image of God. Nature does not, therefore, have rights of its own at the cost of human beings. The promise of God is in his covenant with human beings, which includes his faithfulness to all creation. It is realized in the relationships of justice and love which by His grace can be manifested in human community. Part of this realization is loving care for the physical world as well, so as to bring out its beauty and establish its peace in harmony with fulfilled human life. To care for nature at the cost of human justice or love is a form of idolatry. Not to include the care of nature in planning for justice and love among men is to miss the fullness of God's promise.

What does this mean for the quality of life which Christians should express and seek to realize in the midst of nearly boundless technological possibilities? Three emphases, somewhat in tension with each other, though not entirely opposed, emerged in our debate. Each of them is an effort to guide Christians in confessing their faith, as part of a dialogue with all men, whatever their faith about the norms and values of the common life which Christians and non-Christians can affirm together.

(1) There is a style of involvement in the economic, technological, and political systems of our time which will aim at the meaningful participation of all people in them on the broadest possible scale. By distributing power and democratizing decision-making, the promise of technology for mankind can best be realized and the promise of creation best fulfilled. This means improving the distribution of information by technical means. It means broad public discussion

of basic decisions in technological development. It means special provisions to bring the poor, and the whole less-technically-developed world into the process as free participants. It means education for meaningful responsibility of all sections of the population with their often conflicting interests, rather than working from ethical principles which seem clear to experts. This responsibility might, for example, affect the use and distribution of capital for industrial development, the manufacture and use of chemical fertilizers and pesticides, or the cultivation of ocean fisheries.

(2) There is an opposing style which calls for a deliberate, symbolic but also strategic withdrawal from the complex technical economic and political structure of power and privilege now characteristic of much of the industrially developed world. This modern asceticism would not be world-denying, but an effort to restore a sense of proportion. Is there not something in Martin Luther's sense of priorities: if God loves us, the outward condition of our lives is a purely secondary matter? Are there not dimensions of human life with God and our neighbours which may be as much harmed as helped by the intense growth of material power and prosperity around us? There is perhaps no more effective way to bring a society bound to the endless expansion of gross national product back to taking thought for human values, than to withdraw from participation in the process. That could be a prophetic 'No' to the false values of our economic system. Furthermore, it would be a sign of the responsibility of wealthy nations to exercise a similar ascetism in order to meet the needs of the poor of the world. It could be an expression of the freedom which Christ gives to be *for* our fellow man.

To all of this there is of course a *warning*. The ascetic witness is one that must be chosen freely as an affirmation of justice and love, nor used to excuse enforced poverty of others. It must be part of the struggle of the poor for liberation from their material bondage, part of the search for the true relation of the material to the human in God's promise.

(3) There is a style which would risk concrete, theologically grounded assertions about the quality of life, involving a certain analysis of modern technological development itself. These assertions would be guidelines in the present situation, ethical positions in the dialogue with the world of technology about what a truly human life would be. They would be subject to modification in the dialogue but would aim to be faithful concretions of the intention and work of God in this world. Examples of such assertions might be:

(a) A basic criterion of the worth of any technology should be how far it serves to realize justice among human beings, in the Biblical sense of that word: to bring to the poor, the disadvantaged, the oppressed a new and freer life. This in fact is the action of God. He raises up the poor and blesses them. He vindicates their cause. He brings them into the community of free and equal persons, and empowers them to take part in it. The test of any technology is its service to this justice, this liberation, and this empowerment. We have in mind here the poor, the migrants, the racial and national minorities in our several industrialized countries, but even more the great majority of people in other continents who do not participate in the power and prosperity which we enjoy. A technology that merely benefits the already affluent has little human value.

(b) Technological development means that the neighbour whom we are commanded to love is not only the one who is physically nearby. Our power and prosperity affect people across the globe. But already in New Testament times the disciples were sent to bring the Gospel to the end of the earth that all men might become one community. A test of any technology is its capacity to bring persons into relationships of mutual responsibility across every barrier, whether national, racial, class or simply distance. Is it the servant of true human community, or its destroyer?

(c) Modern technology has the capacity to liberate human beings and to present them with free choices and powers undreamed of in past ages. It also has the capacity to control and limit people more completely than ever before. The believer who knows the freedom of bondage to Christ will not value the freedom of unlimited power and choice which technological liberation seems to promise, but he will resist with his whole being the enslavement which technological control brings. A test of any technology is its capacity to enhance man's freedom to discern and fulfil his human capacities in community with others, nor just to express himself as an individual with more power and less interference.

(d) Modern technology has been disproportionately directed to military purposes and to production of material goods for private consumption at the cost of public and long-range values such as adequate housing for all, adequate education, mass transportation, clean air, pure wattter, an enjoyable environment and in some countries adequate health care for all. However, man is responsible to God for his stewardship of the goods of the earth. Irresponsible organization and planning is no excuse. The test of technological development in our time is its capacity to serve the common good, not diverse private interests, at least so far as the basic material structures of the common life are concerned.

(e) Modern technology as a whole has not asked the question how the beauty of nature might be cultivated in such a way as to express the love of God for human beings which expands to include his whole creation. But God does

promise that the desert shall blossom like a rose by his grace under the cultivation of a faithful people. A test of modern technology then is its capacity to bring forth the beauty of nature as an environment for human community life.

(f) Modern technology has gathered people into cities more intensively than ever in history, and at the same time threatens cities with poverty and decay, while the powerful and well-to-do move out to more pleasant surroundings. We do not presume to describe the style of common life which would be ideal for mankind in his future residence, work and play. But we dare not forget that the ultimate fulfilment of human life in the Bible is symbolized in a city of God. Human beings are called to live with, not separated from, one another. Rich and poor, young and old, workers and professionals belong together in one community. We dare not therefore permit the demands of industry and technology or of human greed and pride to destroy urban life. The city must be made a truly human environment, reflecting the justice, beauty and community God intends for our common life. The test of modern technology with respect to cities is thus its capacity both to alleviate the alienating pressure built into the cities of our time and to create and implement alternative forms for living together in cities that are yet to be built.

2. What is our responsibility today in the light of the future we expect?

The first question that must be addressed here is the relation between what the Christian expects of the future and what the various futurological predictions based on technological data have led the world to expect. Our society has been assaulted during the past few years with predictions and projections. Some of them are warnings of dire catastrophe if present trends continue. Others reflect confident technological planning. A few express revolutionary hope born of alienation and privation. We suggest here a few guidelines on the basis of which to sift and test these fears and hopes.

First, no Christian can begin otherwise than by pointing to the ground and source of our hope in the God who is the Lord of history and in whose hands the future lies. The temptation of much futurology is to place hope in the capacity of man to control and mould his own destiny. This hope then falls into fatalism when it is disappointed. The contribution Christians can make is to lift this fatalism from the souls of man with a promise which is not deduced from an analysis of the trend of present events but from the God whose kingdom is coming, even understanding physical death itself as an act of God's blessing within his promise.

Secondly, God shares his power with man and gives him freedom to make history in partnership with Him. Historical events are not predetermined. Our hope is in the Lord who in Christ suffered at the hands of human power and who reigns as a servant in this world.

Thirdly, every expression of hope in history faces the brute fact of death. What is the point of working for a future which we will not live to see? Why care for a world of persons yet unborn? Death is the negation of hope and meaning for every human being. There are technological secular answers to this question: belief in the immortality of a collective such as a nation, or the provisions made by private persons for their descendents. But in the resurrection of Jesus Christ and in the communion of saints death itself is shown not to be the last word for man. The personal life of each believer is taken up in this communion and participates in the future which Christ will realize. Christian faith helps to provide the meaning and the discipline for work for the future of mankind despite the limit of death.

Fourthly, the Lord who is coming in final victory is with us now, giving meaning to our time. Christ is a final hope and a present criterion of history. Signs of his kingdom break into our history and give meaning to our struggle for a better human life. His final victory over death gives us hope of victory over human misery, oppression, injustice and hate. He requires of us faithfulness in this struggle as a response to him. He shows us ways to realize these human goals and to combat these evils. Our work of course may be destroyed and our particular hopes may be disappointed. But his grace will not fail us or the world, if we commit our lives to him.

It follows from this that we, as Christians, are not only empowered but commanded to hope for the world in concrete ways, for peace, justice and the fulfilment of human life on earth. We suggest below four examples of how this hope might express itself.

(1) Christian perception of the judgement of God on the structures of human avarice and pride lends a special urgency to the warning we hear from some scientists about the disaster that awaits us for polluting and despoiling the earth, for developing an economy which excludes the poor, and for causing possibly irreversible changes in the balance

of nature. At the same time, this perception should warn us against following every prediction of doom regardless of its moral lesson. We have theological reasons to be sceptical, for example, of scientists who tell us that enforced population control is the only way to avoid human catastrophe, or that limiting our efforts to provide a tolerable standard of living for the masses of Asia is the only way to avoid ecological disaster. It is the God whom we meet in Jesus Christ who is our judge in the future. The analysis we make of coming ecological dangers and the actions of repentance we call for had better refer to His demands on us as to how we should use the technology of our time, if they are to be realistic.

(2) Christian understanding of the sovereignty of God in history should make us sceptical about most of the futurological projections of technological planners who act as if history were entirely an object of scientific manipulation and control. Human beings should indeed plan for a more just and humane future. The use of technological reason in the service of a better world is a blessed activity. But this planning should be the function of present relationships. It should aim at securing the freedom of future generations to make their own choices. It reduces, but does not eliminate the uncertainty which must always be present because of this freedom. Futurology which is mere extrapolation of present trends in human society is unrealistic because human beings are free to repent and change. The projection of provisional utopias in response to the work of the Holy Spirit is far more practical as a context for scientific research with regard to future trends, and human responsibility toward the future.

(3) Christian hope starts from the presence of him whose coming we expect. The quality of human relations and the spirit of the common life in that promised future will not be different from that which Christ requires of us today, nor is God a deceiver about the power which will realize that future. We have reason to be sceptical, therefore, of demands that we act inhumanly now toward our neighbours for the sake of a future to be realized thereby. The Christian community is called to be now in its quality a sign of the coming fulfilment, a witness to the present faithfulness of a God who will be faithful in the future as well. To project this present relation with hope into the future is a better guide than arguments which would take us through questionable means to ideal ends, through violence to a new justice, through war to peace, or through oppression to a new prosperity.

(4) When this has been said, then the final point must be made: the promise of God includes whatever future generations there may be as well as our own. They are members of the human community, neighbours whom we also are to love. As we are required now to exercise restraint on our lusts and ambitions for the sake of the welfare of living neighbours, so we are required to do also with regard to these descendants. At this point, the church should be an advocate in God's name for the unborn generations, as it is called to be an advocate of the poor and defenceless now living in the power struggles of today. In their name we need to set ourselves against the blind and unreflective tendencies in technological development which are the resultant of the power forces behind them. God will take care of his people of the future. But if our present thoughtlessness and greed puts heavy burdens on them, the judgement will be on us.

Technology is ambivalent, with many negative features. It can be turned by man to destructive ends, as in modern warfare. Its capacity to supply material wants can lull us into a passive acceptance of its presence without any will to establish human control over it. It can produce supporting structures of such magnitude and autonomy that they dominate their human subjects. It can lead to economic and environmental collapse. Even if we manage to avoid catastrophe, it is doubtful whether all the negative elements in technology can be eliminated.

But despite this dark side, we believe that Christians are called to accept and to use technological possibilities for the sake of that human fulfilment which God intended for his children at the Creation. Technology does not build paradise, but it does open new possibilities for mankind, extending our life expectancy and enriching our creative enjoyment of the years we are given. Short of the Kingdom of God, there will always be tragic elements in human life; but many of our current ills are *not* inevitable, and an intelligent use of technical skills can help us to avoid and overcome them. Technology should enter fully into the service of true knowledge, both scientific and ethical. Our task is to cherish and use its power beneficently, eliminating the oppressive forms in which we often experience it today, to the end that the new humanity of the Christian promise may find some incipient fulfilment in our history.

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III.

PETROL FOR THE FUTURE? - A SCENARIO

(The following scenario on reducing the use of petrol was prepared by one of the Working Groups at the North American-European Conference. It was in their words, "a fanciful" exercise. Today it appears as shrewd foresight of things to come.)

THE NATIONS OF THE NORTH ATLANTIC DECREASE BY 90% THE USE OF GASOLINE BY PRIVATE AUTOMOBILES - 1975 - 1992

PURPOSE

The purpose of this scenario is to help readers analyze technological options by explicitly displaying some reasonable consequences of two specific changes in technology. It is intended as a stimulus to thought enabling readers to ferret out and confront the kind of issues implicit in the broad policy changes that are often urged on governments. It is not a policy recommendation, but serves as a concrete example of the real-world events the church must consider when it recommends action.

THE FORM

A year-by-year *sequence of events* is used. A *graph* accompanies the sequence in order to summarize the hypothetical reduction of gasoline use.

SEQUENCE OF EVENTS

Pre-1975:

Churches and other forces in the North Atlantic community persuade their governments to adopt policies that will reduce petrol (gasoline) consumption by private cars and trucks in their nations to 10% of the 1975 level by the year 2000. Arguments used to persuade are:

1. Crude oil can best be used for purposes other than petrol.
2. Petrol pollutes.
3. Nations with high petrol consumption are strategically vulnerable.
4. Petrol reserves will soon be depleted anyway.

The policy is one of taxing the use of petrol and using the taxes to pay for research for a replacement fuel. Populations voice great reluctance ever to give up motor-cars, but the governments argue that a replacement fuel can be found.

(1) 1975:

Governments adopt programme and announce that in 1985 internal combustion engines operating on crude oil products will be outlawed. Military and public aviation will be permitted to use crude oil products for fuel without restriction both before and after 1985. Trucking operations are not exempt from restrictions; their price increase is passed on to shippers. Commercial bus companies are exempt, including city transit companies. However, bus companies are urged to adopt alternate power sources.

- Governments establish Petroleum Conversion Research Administration (PCRA). PCRA carries on massive research in replacement for petrol-burning engine and for alternative fuel (e.g. hydrogen or liquid ammonia derived from electrolysis os catalytic cracking of water).
- Governments initiate tax of 20% at the pump, in addition to existing retail price on petrol. Tax will increase 20% per year for the next five years.
- Tax and selected highway funds go to PCRA.
- Oil company stock prices drop. Bondholders sue governments.

- Government funds additional research in mass transit, in anticipation of transferred demand. Funds available for unemployment insurance are reduced to provide this funding.

(2) 1977:

- Demand for smaller cars increases, so that less petrol per mile is consumed. One result is lower performance in cars.
- Purchases of crude oil from the Organization of Petroleum Exporting Countries (OPEC) decrease.
- Price of petrol reaches nearly twice 1975 price.
- Rail travel increases.
- Rail shipping increases. Trucking shipments stay at 1975 level.
- Petrol supposedly obtained for bus use enters black market.
- Pressure rises to expand use of nuclear reactors in anticipation of need for more electricity for producing alternative fuels.
- People begin to seek jobs where non-car commuting is possible. Car-owners have lower disposable incomes.
- Fuel-cell powered electric cars enter market.
- Auto sales level off.

(3) 1980:

- Petrol consumption stops growing and begins to decline.
- Crude oil purchases from OPEC offers special rates to certain Third World countries in an effort to sell more crude.
- Trend of non-car commuting continues. People press for improved rail-bound surface transportation. Firms tend to locate in areas where commuter transport is available.
- Alternative fuel engine designs tested on road by PCRA.
- OPEC nations begin job-layoffs in some oil fields and refineries.

(4) 1983:

- Disengagement from OPEC increases.
- Boom begins in rail-bound rapid transit and intercity rail travel.
- Air travel increases, due to higher cost of car travel.
- Significantly more efficient petrol-burning car is developed by PCRA.
- Oil companies complete a shift to new industries, investing capital in non-petroleum resources.
- 1985 legal deadline on petrol-powered cars moved back to 1990. Auto sales decline for first time since World War II.
- Toll roads recover less payments and require increased subsidy.
- Highway construction nears standstill.

(5) 1985:

- PCRA develops alternative engine and fuel which could be mass-produced, but fuel requires massive amounts of electricity for production (hydrogen or liquid ammonia).
- Use of motorbikes increases massively. All petrol produced is consumed. Price is seven times 1975 prices, excluding inflation, owing to increased taxes for PCRA funding and for other purposes, including anti-pollution subsidies by government to industry.

(6) 1987:

- PCRA announces that hydrogen engines are too dangerous and do not appear to be usable at costs less than petrol (now 10 times 1975 prices). Liquid ammonia engine may be usable. Governments begin to use petrol taxes for military expenditures – for new vehicles' but also for soldiers' pay.

- Bitter resentment is directed towards PCRA over failure to provide alternative power for private cars. Population insists on mobility of private car. Political campaign hinges on issue. Railbound transportation grows in use.
- Automobile sales now 2/3 of 1975 levels. GM stock drops to 3/4 1975 level. GM joins PCRA research effort. Claim is made that GNP's in North Atlantic are depressed 5% due to fewer auto sales. Incremental unemployment of 1% is linked to PCRA failure to find new car. Most GM sales are fuel-cell cars, which cost twice what 1975 cars cost.

(7) 1988:

- Demand to repeal Petroleum Conversion Act increases.
- Pressure groups demand freer mobility in urban areas. Population refuses to give up freedom of individually owned cars.

(8) 1989

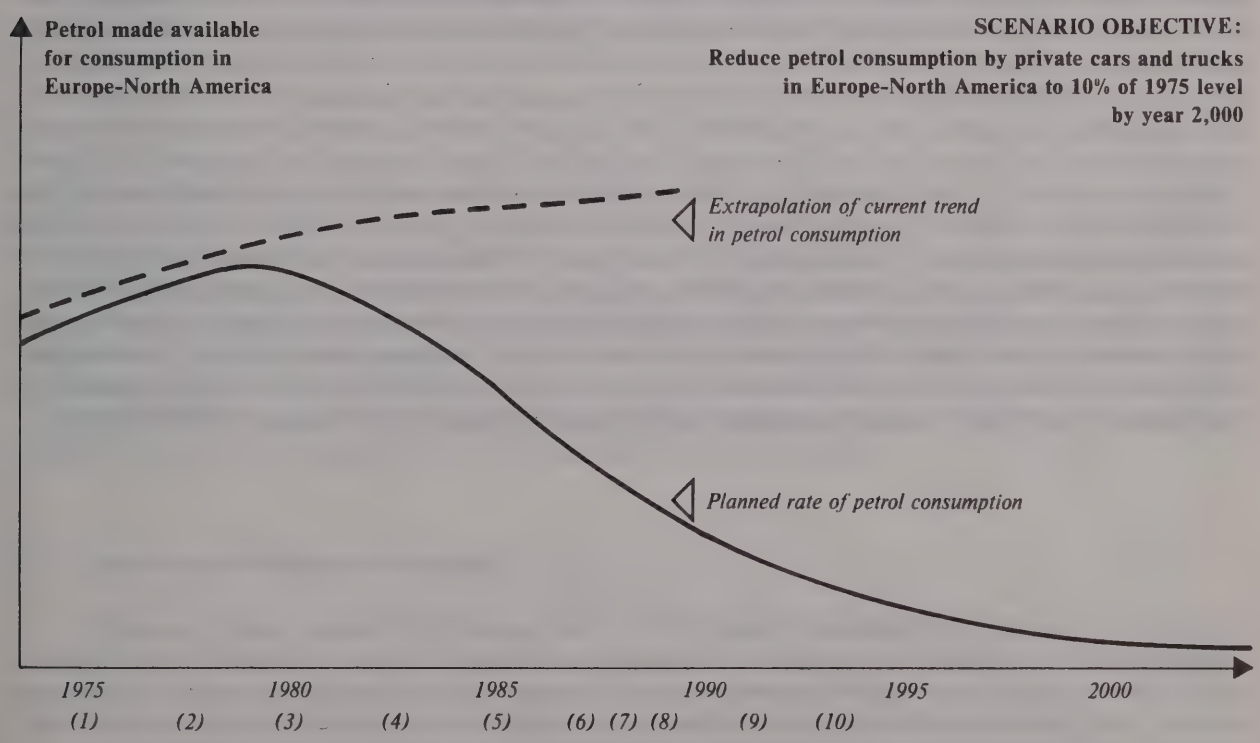
- Demand for non-petrol automobiles, at low cost, grows to huge proportions. Fuel-cell car sales level off due to exorbitant price and low performance.
- VW markets a liquid ammonia vehicle, Fiat markets a zinc-air battery powered vehicle.
- Additional nuclear power plants are built to provide electricity for manufacture of liquid ammonia.

(9) 1990:

- Highway accidents occur with liquid ammonia in fuel tanks. In one case, a young couple is killed in new car when high pressure tank fails.
- Petrol engine ban goes into effect.

(10) 1992:

- Public demands that manufacturers produce safer ammonia tanks. VW sales reach and surpass 1975 levels. Rome has first traffic jam in ten years.



IV.

THEOLOGICAL PROBLEMS RAISED BY TECHNOLOGICAL OPTIONS THE CONFESSIONS OF AN ECONOMIST

Claude Gruson (France)

In what way does the theologian feel that his own thinking as a theologian is challenged when he observes and tries to understand the development of modern technology in the industrialized countries? The person drawing up this first draft of a paper for the Pont-à-Mousson Conference is in principle not really qualified to answer this question, since he is an economist and not a theologian. But an economist who reads the Gospel and so constantly tries to live engaged in dialogue with the theologian, finds that his experience and reflection impel him to question the theologian insistently on what he has to say about the future of mankind and the world and about the active attitudes that should reasonably follow from what he has to say. This urgent question has not yet received any reply that prompts the economist to say that the Church has now quite definitely spoken in a way that is useful to people occupied with the business of this world and concerned about their commitments; there has been no ethical statement made, entailing really operational criteria of choice. Until this has been achieved, it is perhaps not useless for the economist to change his ground, turn theologian to the extent of his ability and speak in his terms.

1. THE READER OF THE GOSPEL KNOWS THAT, LEFT TO ITSELF, THIS WORLD IS SELF-DESTRUCTIVE, YET IS DESTINED TO UNDERGO A FUNDAMENTAL RENEWAL

It is not on this point that the dialogue between theologian and economist runs into difficulty. Technico-economic history has never ceased to ring with echoes of the story of the Tower of Babel, and they are more numerous than ever today. But the most striking contribution of economic analysis here, is its uncovering of the processes by which, in the present phase of development of free enterprise economies, the holders of power (a power which is only maintained and affirmed by struggle) have decisive weight in determining the orientation of the life of society; it is their ideas that prevail, the ideas of people totally preoccupied with the problems of their own survival in an intensely competitive world – ideas about management with a limited horizon, incompatible with any social construction drawn from systematic ethical reflection. Even when they take advantage of this movement by working less and consuming more, those who are caught up in it find they have in fact only an extremely limited freedom of choice. Either they try to enter and remain in the narrow circle of the powerful, or they passively conform to modes of life which they have not really chosen and which are devoid of any ethical significance, or they pin their hopes on the destruction of the system – the destruction that is, of capitalism or of any system that assigns an important place to technical efficiency. All this constitutes a process which may be termed diabolical in the deepest sense of the word, because it unfolds even without deliberate malice on the part of individual wills. On the contrary, men whose individual intentions are constructive and pacific are frequently its agents. The rules of economic and social organization which they observe and which result from the empirical construction of Western industrial societies, compel them to engage in a struggle in which their very survival depends on their imposing their strategy. It is a struggle in which their weapons are a capacity for organization and technical renewal which usually only financial power can provide. The incidents that mark the kind of struggle that is going on at the present time, are too disconcerting to justify great plans or to open out any intelligible future.

The absence of intelligible future prospects then breeds the most monstrous aberrations. It arouses mistrust between nations and social classes, makes those in power seek for security at any price, with the resulting development of the armaments industries (and the scientific and technical research that goes with them), and the proliferation and growing role of military and police organizations. Furthermore, in the absence of any orienting principle, economic growth is pursued without restraint even when in the long run it spells a rapid worsening of living conditions and final ruin. When this danger is realized, emphasized, perhaps exaggerated as it certainly is in the Club of Rome report, it becomes one of the primary preoccupations of technologists: the technical solutions it demands are effective diversions which conceal the absence of any guiding principle of economic growth. Such a principle could only make sense if it were political and ethical.

All this is a fact which needs to be properly understood and constantly borne in mind, for it, too, echoes the whole biblical teaching on the universal power of sin, on the way it is rooted in the history of mankind, on the form it assumes of a strategy hostile to the strategy of salvation. It is important to perceive this echo, for it carries a warning against all optimism founded on affirmation of the capacities of renewal of the world as it exists now, obvious though they may be in certain respects.

Yet, for the reader of the Gospel this lost world has a future before it: that of the Kingdom, the future renewal defined by the Beatitudes. The parables of the Kingdom tell us that this renewal is already present and active, though hidden; that some of its elements are taking shape although they are imperceptible to man today as wheat is in a field sown with darnel; that the moment will come when these elements are chosen and combined into a whole, as the good fish are chosen from the one mixed catch in a net. At that moment the creative power of the Master of the Kingdom will be manifested, brought totally into play so that none may be lost, but free and disconcerting for all; no human being will be able to say that his personal work was useful in some way or that his aims prevailed.

On the contrary, the Gospel states fundamentally that this construction will be felt by everyone involved in it as a death and resurrection – the death of personal plans and a collective resurrection. Jesus' death and resurrection make us understand this. Jesus the first witness to the reality of the Kingdom was killed by men who were no more ill-intentioned than those in charge of our present-day societies; they were merely prisoners of the narrow conception they had of their own responsibilities, and confined their action within a narrow horizon. We continually hear the echo of that death in historical experience and in our personal experience; on the individual plane, all action is caught up in the short run by determining factors manifesting themselves as inescapable violence and apparently forming a world of despair. But Jesus' resurrection underlines the fact that beyond the immediate failures, Christ's entry into the history of men, leads it towards the Kingdom, gathering together all the elements which it has developed, by a final and all-powerful intervention of God comparable to that which raised Christ from the dead.

2. THE ETHICAL IMPLICATIONS OF THE PROMISED RENEWAL

What types of action do these perspectives logically lead to? Traditional Christian ethics concerned itself primarily with personal conduct. When it did extent to politics it was generally unable to form any clear conception of the means which would make positive and significant action possible. In view of the dangers threatening the future of industrial society, should it acquire a political dimension? If so, should this political ethics be one of withdrawal from a world which is doomed (to the extent that men are its builders)? Or should it be an ethics of insertion into a world within which it would be possible (and therefore necessary) to fight determining factors of violence and injustice which sooner or later will be swallowed up in the final construction of the Kingdom?

a. Is an Ethics of Withdrawal Possible?

Reflection on what an ethics of withdrawal might involve would be necessary on the supposition that objective analysis showed the absolute inability of any action to orientate the present radical changes in the world towards an economic and social system in which the mechanism of violence at present dominant would cease to dominate. Faced with this radical powerlessness the Gospel reader could not reasonably envisage any attitude except that of waiting for the end of the world, accompanied by a strictly personal preparation for the life to come in the Kingdom. In the history of Israel as in that of the Church, situations in which an ethics of withdrawal has been formulated and lived are not

rare, although the fundamental biblical teaching does not reject the idea of a domination of man over nature, and consequently does not condemn a priori all techno-economic organization. In this line of thought it could be admitted that the Church might be led to formulate a warning against the actual moving force of all present-day industrial societies, that is, the systematic utilization of the results of ever more extensive scientific research in a permanent effort to rationalize and recast economic activities. It is conceivable that the Church might formulate this warning and support it by a prophetic attitude consisting in living apart from modern economy, having broken off all contact with it.

It may be doubted whether an ethical choice of this kind would provide the Gospel reader with a coherent attitude. Three reasons can in fact be urged against it.

i. The difficulty of breaking every link of complicity with the present-day world

A real and substantial rupture between a community claiming to refuse all complicity with the principles of organization and evolution of the world of the present day as well as with its actual economy, would be very difficult to carry out. The hippy communes only subsist because of their contacts and exchanges with American society around them; without them they would perish. So they are not without solidarity and, ultimately, without complicity with the society which they claim to reject. To avoid it, they would have to contrive to live in complete self-sufficiency, which would mean their inventing adequate techniques of production and distribution. They have not done so. Nor have partisans of an ethics of withdrawal seriously attempted to put it into practice, at any rate in the industrialized countries of the west. The problem of whether an ethics of withdrawal is a possibility for the men of the Third World will be discussed later.

ii. In regard to certain capital and inevitable problems, present-day technical efficiency (however disputable it may be) opens out possible solutions

The principles of the organization and development of the industrial world are geared to efficiency. A false efficiency, say their critics; and it is quite true that the play of free enterprise and a market economy does orientate the economy towards the satisfaction of non-essential wants and ignores a very great mass of essential needs. Even allowing for these criticisms, however, industrial economies cannot be accused of having no efficiency; it cannot be denied that the systematic use of advanced scientific and technical research for the benefit of the economy, the general adoption of a rational attitude to problems of economic organization, the decentralization of decision-making – which places each executive in a firm in contact with the need which it is his function to meet and gives him access to the means which he must combine for the purpose – and the play of the markets, all these characteristic elements of Western industrial economies contribute to bring to light needs which are not all artificial or derisory, and to satisfy them more perfectly. It is therefore reasonable to speak of efficiency here.

If that is so, it is also reasonable to think that people's living conditions, their nature, the perils that threaten them, are problems which concern us and which our efficiency ought to enable us to solve. From now till the end of the century the growth of world population will be an inevitable fact and one of unprecedented historical importance. It is chiefly located in the Third World, that is, in countries which do not benefit by the efficiency of the industrialized world. They are, in fact, excluded from it, because their cultures (however rich in other respects) do not permit them in their present state and in the present state of international organization, to become an integral part of or share in the economic movement of which the industrialized countries are the seat. On the contrary they are sometimes the victims of this very economic movement, because their own activity from its repercussions which constitute factors of instability and set them insoluble problems of adaptation. In face of these enormous scandals on a planetary scale, which drive their victims to the kinds of acts of despair of which we see so many examples at the present time, an ethics of withdrawal is impossible.

iii. Present techno-economic development by destroying and compelling reconstruction of the principal elements of human societies, opens up new liberties which must be used reasonably in the direction of the promised renewal

The deepest reason for setting aside any ethics of withdrawal becomes apparent to anyone who tries today to delimit what may be called the field of ethics, that is to say, the domain in which man sees or on certain conditions can see possibilities of freedom open to him which permit the satisfaction of desires which he is capable of integrating into consciously thought-out conduct, the kind of conduct which he could ultimately fit into a coherent conception of the world and the role he plays in it. For what economic reflection indicates in this respect is that the mechanisms of the

contemporary economy are opening out possibilities for the radical renewal of all social life, because they call in question all the elements – social, economic, cultural, institutional – which until very recently appeared to be stable or at least very difficult to alter. There is no business firm which is not aware of constant change in the nature, extent and geographical location of the demand which it works to supply, in the techniques which it employs, the plant and equipment which it uses, the skills it demands of the personnel it employs, the qualifications they have to have, the supply lines through which it obtains its raw materials and energy. There isn't a skilled workman who doesn't have to be retrained and brought up to date if he is going to be of any practical use throughout his lifetime. Every educational establishment is obliged to provide new forms of training adapted to keep pace with the growth of knowledge, to provide vocational and professional qualifications constantly changing with the development of production techniques and of economic structures. They are faced with demands that keep changing with the requirements of economic activities and the cultural needs of the population. They are correspondingly obliged to call on the teaching staff constantly to renew their own basic formation and to bring their teaching techniques up-to-date, or even repeatedly to invent new systems. Every public service has to adapt itself to new collective needs and wishes which themselves derive from economic transformations and the ensuing necessities of adaptation which they impose on the public, from the corresponding geographical shifts, and in general from changes in living conditions.

Because they are constantly called in question, the economic and social structures – those social, economic, cultural, institutional elements which until very recently appeared stable or at least very difficult to alter – are in constant need of thorough adaptation, which in some cases even involves their destruction and subsequent reconstruction. To the extent that these structures are also political ones, linked with the hierarchy of powers and the necessary conditions for the establishment of social justice in all its aspects, this succession of destruction, reconstruction, adaptation, progressively opens up the freedom to move the world forward towards a future in which social and political objectives which not long ago would have appeared completely chimerical, can gradually be attained.

If in this way liberties are opened out which are specific to our time and which, if correctly used, would make it possible to move the world towards a future in which political norms – of the order of justice and fraternity – could be progressively fulfilled, or at least less generally violated than they are today, a field of action opens out in relation to which no ethics of withdrawal is defensible and which, on the contrary, calls for positive theological and ethical reflection.

b. Principles of a Positive Ethical Reflection

i. The emergence of any freedom immediately raises the problem of its reasonable use.

This statement is logical and echoes everything the New Testament says about the freedom of faith. Open the Gospel hope, aware that the world is called to the fundamental renewal which will make it a world of love, justice, knowledge, the man who lives in faith no longer has to seek his rule of conduct in a pre-established law. He is obliged to pursue ethical reflection guided by his hope, and Paul does not content himself with formulating the principle of this reflection ("consider yourselves dead to sin and alive to God in Christ Jesus"), but gives some concrete applications in the First Letter to the Corinthians and the Letter to Philemon. Certain parables of the Kingdom indicate the necessity, intensity and depth of this reflection, which applies to man's whole present capacity for action: in view of the incomparable value of the hidden treasure or the pearl, the man whose whole hope now is to obtain this treasure or pearl, employs every means at his disposal to achieve this. The rationality of ethical thought considers and sees as a coherent whole the aims pursued, the available means, the way they are used. This rationality is strongly emphasized by the parable of the unjust steward. It takes the very rigorous form of economic calculation or strategic planning in the renunciation parables of Luke 14:28-33.

ii. The problem of the possibility of a political ethics

Traditional ethical thought in the Church – even that of which traces are included in the New Testament – concerned problems of personal conduct. The possibility now emerging of modifying social and political structures, opens out new freedoms. But they are available to the collectivity, not to the isolated individual; they therefore make reflection on collective, political ethics imperative. This is a new fact in relation to the tradition of the Church, though less new in relation to biblical tradition itself, for the preaching of the prophets was largely concerned with social morality.

DPart of the difficulty of this reflection is that in view of the primary aim which is to discover the freedoms which will permit us to live our hope (by gathering all we possess and using it to buy the pearl), it has to mobilize techniques of economic, sociological and political analysis which have never been used before for this purpose. Reflection on collective ethics? No; chiefly because the man who lives with the Kingdom in view knows that this outlook is open to all others and that he has no right to reject the other when he meets him nor to enclose him in a judgement which restricts his liberty and his calling to fraternal dialogue. The Gospel does not merely reveal a distant vision: the vision itself imposes its own demands for immediate action. On this point the Church's traditional ethical reflection continues to be valid. But it needs to go further though still remaining on the plane of personal ethics: it is certainly possible to transpose into the domain of ethics a kind of thought and practice which originated in the quite different domain of techniques of action with a view to fitting decentralized responsibilities into a collective project.

This is a peculiar difficulty, which will not be overcome without long efforts. What can be shown is the extent of the domain in which the possibilities of using present technical developments can be investigated with a view to building political systems orientated towards the evangelical hope.

Existing systems compatible with rapid industrial development are very various. Those that are mainly founded on free enterprise, when examined in the light of possible political renewal in the world, are seen to possess imagination and inventiveness but at the same time their aims are ambiguous, excessive weight attaches to the market economy to the detriment of that of public services, and they tolerate social inequalities. The systems which are chiefly based on centralized planning are seen to possess in theory the possibility of clearly envisaging long term political objectives and of giving preponderant weight in determining these objectives to organized discussion and enlightened collective reflection rather than to the play of the markets; on the other hand, they involve the weight and relative sterility of their bureaucracy. Political thought at the present day generally does not try seriously to weigh the reasons for choosing between these different systems; it develops from an initial choice, based on traditional or emotional data. Consequently only those problems are taken into consideration which collectivities visibly encounter within their own system, and no serious examination is devoted to the conditions in which that system might develop in a more distant future by a change in its deeper characteristics. But political thought prompted by the hope of world renewal brought by the Gospel, has first to disengage itself from existing systems, which are all for various reasons incompatible with that hope. At the moment when such thought achieves the inventive intensity demanded of it by the hope that inspires it – when it sells all that it possesses to buy the pearl – it must disengage itself from the system in which it is placed, freeing itself from the dogmas of free enterprise and private property or from those of socialist planning. It must regard the serious examination of the instruments of innovation furnished by all existing systems as an apprenticeship and training of its own fundamental liberty.

When these various systems are analyzed in the light of this kind of thought, it is evident that they are all in movement. The free enterprise systems are progressively developing techniques of economic rationalization, and these techniques have have logically to be supported by a certain kind of centralized planning which passes progressively from the planning of great economic decisions to that of social policy, then extends to institutional planning, and ought finally to take the form of political planning in the light of political debate of a new kind which would doubtless reveal the social and political renovation called for by current structural changes. Systems of centralized planning, on the other hand, are seen to exhibit an increasingly systematic effort to create the conditions for a decentralization of decision so as to bring all managers into closer touch with the demand they have to meet and with the means they must employ for the purpose. Those conditions are of a technical and economic order, but to the extent that they concern the information system they facilitate, if satisfied, democratic discussion. These observations do not mean that the free enterprise and the centralized systems will develop on converging lines towards a more general system that would combine the efficient qualities of the first and those of clarity of policy of the second. But they do show the great wealth of concrete experience and theoretical progress in present-day economic, social and political thought.

Inspired by the will to express the expectation of a renovated world, this kind of thought would have a good chance of succeeding in formulating an evangelical ethics, a genuine, that is to say operational, ethics extending into the political domain.

At present it is only possible to glimpse the possibility of ethical thought and reflection of this kind. Without trying to foresee the conclusions to which it would lead as a result of what must inevitably be a very long process of thought, some of the lines it would take appear possible to foresee even now.

iii. The main line of inquiry of a political ethics: to formulate the principles of really democratic institutions

Economic, social and political institutions expressive of the expectation of a world made new, a world of fraternity, justice, knowledge, would necessarily be democratic. At a moment unprecedented in history, when people are compelled to make choices on which in the long run their lives and those of their children depend, the liberties they intend to defend, the possibilities they will have of satisfying their desires and of giving concrete expression to their ethical ideas, it is a fundamental form of love of the neighbour to ensure that he has political institutions in which he has a chance of thinking out his choices, of expressing them, and getting an effective hearing in political debates where the basic decisions are discussed.

The problem of democratic institutions has found no solution at present. There are many reasons for this, some historical, others bound up with features peculiar to the present situation.

In countries drawing on the Western tradition of parliamentary democracies, the great complexity of the system of information which ought to illumine basic decisions, places a very serious difficulty in the way of initiating really free debate. This complexity is so great that to the extent that any information system is being constructed, this is due to the pressure of the needs felt by those in power to explain their decisions and views. As a consequence, there is constantly the risk that free opinion will be without the information needed for it to take proper shape and intervene effectively in debate. This is one of the main problems encountered at the present time in establishing genuine democracy in the Western countries. It cannot be solved quickly, and that is why autogestion, workers' participation and control – the supreme aim of democratic construction in every modern country where economic factors are decisive – appears at present as no more than a still distant utopia.

The importance that should be given to the prime necessity of constructing an information system capable of explaining all projects – the projects of those currently holding the power no more than any other ones – should not be allowed to conceal the fact that even perfect information is not enough. Democratic institutions should also be capable of processes which impose a minimum of discipline on emotions, on conflicting interests. They should be capable of making systematic forecasts, but forecasts which leave room for an element of chance. As for autogestion, it cannot be achieved simply by organizing collegiality: general participation in debate does not readily lead to the continuing agreement which has to be maintained if it is to inspire coherent action. In a general way, the dimensions of the democratic institution should be thoroughly examined.

However let us return to the urgent problem of information. Theological reflection in this respect ought to lead to a concrete decision itself to collect information to enlighten the poor of this world and enable them to take part usefully and permanently in the democratic debate, and, when this debate is ineffectual, to pursue their struggle effectively. The Church would thus orientate current developments in the direction of a world of hope. For in a concrete way it would throw light, as it alone can do (since the horizons of thought and action of all other, human, institutions are inevitably narrower), on what actions would take their pattern from the fundamental renewal awaited in the promised future, thus faithfully preaching to the world and correctly reflecting the message of hope of which it is the bearer.

Outside the industrialized western world, the establishment of really democratic institutions raises special problems. The chief mistake in Western countries on the subject is probably the assumption that the historical movement towards democracy necessarily passes, as in the West, through parliamentary institutions and free enterprise. But are the strongly integrative political, social and cultural institutions which China has inherited not capable, under the pressure of a socialist ideology, of producing institution that are democratic yet quite different from those of the West? Are perspectives of that kind not open in all the regions of the world with civilizations that grew up independently of European civilization, in India, the Islamic countries, Africa, Latin America? The ethical reflection of the Church must raise these questions and attach great importance to them, because the evangelical perspective of a fraternal world must absolutely prevent any repetition of the dramas which have unfortunately marked the course of history in the countries where the Gospel has been preached: that of one civilization crushing another.

Colonial oppression has assumed many forms, and one of them is still very active. In the Third World, a system dominated by free enterprise imposed by the West will never be directed towards a kind of activity which, while it liberates men from material want, takes its pattern from freely invented modes of life. This statement is not in any way rash, because all free enterprises in a rapidly changing economy have very limited time horizons. Disposing almost exclusively of techniques adapted to the markets and general economic conditions of countries with infinitely more complex organization and very much higher living standards, these enterprises can only envisage a few possibilities when

they come into contact with populations whose purchasing power is and will long remain extremely small. They can graft certain narrow sectors of the economy of the Third World on the great supply lines of the developed world for raw materials or partly finished goods (those from sources mainly situated in the Third World); they can channel the use of the purchasing power thus distributed towards markets supplied by local production and using techniques derived from the developed world; in the most populous countries where division of labour already exists, where specialized production and internal exchanges have reached a certain level, free enterprise can introduce into such production and exchanges, techniques inspired to a greater or less extent by those of the developed world. Of course the development of the Third World does not take place solely in these ways; there are numerous instances of well-organized thought applied to local techniques and organizations, which has roused these from stagnation and integrated them smoothly into a progressive evolution in which the vital needs of growing populations can be satisfied and modes of life devised in harmony with the deep tendencies and traditions of the people concerned. But taken as a whole, there is no doubt the present mode of development of the Third World is chiefly that of transposing techniques conceived and perfected in the developed world. So too, the evolution of modes of life in the Third World is subjected to the preponderant influence of products which were actually designed for use in the developed world. For the poverty of the Third World, the rapid growth of its population, and the urgency of the problems it faces, ensures that every technical difficulty is dealt with in the most expeditious way, which is by appealing to the arsenal already available in the developed world. We can be equally certain that whenever supplementary purchasing power appears, some consumer product designed in the developed world is always ready to find a new use and extend its markets. The development of the Third World thus proceeds by transpositions and imitations, without recourse to the independent creative power which exists there, or which would appear if the intellectual elites and, progressively, the peoples of the Third World, armed with the tools of analysis which are part of the common patrimony of humanity, were placed in a position of being basically responsible for dealing with want, demographic expansion and, in fact, the whole human adventure and the need to make sense of it. But a creative power is inhibited when it is not used; and that is how the Third World is imprisoned in a situation of dependence which encourages revolt and gives grounds for fear that this revolt may quickly turn into a revolution of despair. From this point of view the political ethics called for in the Third World, with regard to the movement of the industrialized world, is an ethics of withdrawal.

On this point, too, inventiveness is called for. The very nature of the inventiveness required gives its stamp to the ethical reflection to which readers of the Gospel are invited at the present day: a reflection in which the theological data will give rise to an ethics only if they are combined with deep knowledge of the world of today.

3. IMPLICATIONS OF A POLITICAL ETHICS FOR A STYLE OF LIVING TODAY

The preceding sections show the urgent need for the Church to embark on a profound process of reflection; an analysis of the modern world and the present fate of man using all the available means for gaining knowledge and making it possible to give concrete expression to all the action to which the Gospel calls us.

It is a profound process of reflection: and it will be a difficult and protracted process. How should the reader of the Gospel live and act in the meantime while waiting for it to reach its first conclusions? – conclusions which in any case will constantly need to be renewed.

a. In the first place, the traditional Christian ethics continues to be valid. For the reader of the Gospel, loving his neighbour as himself essentially means recognizing that every being who for a moment or for a life-time is part of his environment, is a brother destined for the same future, even if he is unaware of it: as such he therefore cannot be rejected, nor oppressed nor arbitrarily judged. However, though he should continue to look on his neighbour in the way explicitly commanded by the Gospel, he should in the same spirit take account of the fact that the behaviour of present-day man towards the other and towards the world is more visibly than in the past conditioned by a variety of determining factors which we now understand better. The Gospel bids all those who read it to understand themselves as fallible men and to love their neighbour with that love which "bears all things, believes all things, hopes all things, endures all things". In the striving towards this sort of knowledge the human sciences provide means which are not only useful for theological and ethical reflection but which lead us to experience the teaching of the Gospel in a new and inventive spirit and approach it through new channels.

b. On a provisional basis, and until the process of reflection defined above reaches its conclusions, the reader of the Gospel has to live in the industrialized world. Since an ethics of withdrawal is not acceptable a priori, he has to participate in that world because it is difficult, perhaps impossible to break all links of complicity with it; and because the positive potentials of the industrialized world, potentials which will perhaps make it possible to reveal signs of the promised future that are not insignificant, are only apparent to those who are able to make a complete analysis of the mechanisms controlling its evolution: and only those who live in that industrialized world are in a position to carry out such an analysis.

However, it is necessary to exercise discretion for it demands a great deal of vigilance to live in the industrialized world, to adopt what is inevitable in the ways of life it imposes but reject their immediately unacceptable elements. It is no doubt the task of the communities to organize this vigilance.

c. Finally the reader of the Gospel must live in the world taking account of the fact that a political ethics is essential there; even if it is not as yet wholly thought out or formulated. The man who reads the Gospel therefore cannot escape being involved in present-day debates and struggles. These political debates are of course unsatisfying because the programmes of the different parties – which can more often than not be criticized because they are formulated on the basis of inadequate information – are confined to a horizon that is too narrow to encompass the hope of the renewal of the world. In joining in the political debate the reader of the Gospel thus has to associate himself with opinions which he will not be able to give his full support – without being able to advance valid criticism of them as long as his own process of reflection has not progressed. In this hazy situation he has however one clear criterion to guide him: he can only ally himself to the poor of this world, because it is they who have the promise of the future.

V.

IMPLICATIONS OF COMING TECHNOLOGICAL CHANGE FOR SOCIALIST SYSTEMS

Ernest Petric (Yugoslavia)

I

1. The tremendous technological change of today, with all its promises and threats, is a universal process, a world scale problem. Its consequences may sometimes appear on a different level or in a specific way, but they are faced by all nations, today and even more tomorrow. If there appear differences, let it be stressed, they are more a result of a different level in the general development of the nation or of a part of the world, than of a different political system or ideology[1]. It might be said, that the problems of quality of life as the consequence of the continuing technological change, are very similar if not identical in all of the so-called industrialized world, let it be socialist or the capitalist part of it. Thus, it is not an unexpected fact that as in the OECD or in the EEC countries and institutions, in the COMECON countries and institutions too, the problems directly connected to the quality of life deserve the highest priority. Let me only mention the science policy and international scientific cooperation of those countries, where the priorities are very similar to those followed by research activities in OECD or EEC countries.

2. Although the problems are similar and even identical, regardless of whether we face them from the standpoint of a government, an enterprise or an individual, the means and the methods which are used or can be used depend – to a great deal – on the political organization and ideological background of a country. Some means and methods, which can be successfully used in a free enterprise economic system might produce a very poor result in a centrally planned economy[2]. The discussions, what is better or worse in general, seem rather unproductive. It is much more fruitful to realize what are the best means and solutions that can be used in a definite political system. And let there be, as much as possible, an international exchange of experience, and cooperation. And as the Stockholm Conference has stressed, there has to be also a common aim, to "satisfy the fundamental needs of man who, while demanding to have more, at the same time aspires to be more"[3].

3. The technological future, and its problems, today often evokes more fear than hope. Although there are dangers, which we must realize and avoid, there is no reason for pessimism to prevail. The prosperity, security, justice and freedom which humanity enjoys, are uncomparable to any period in the past, and are the result, ultima ratio, of the rapid technological change in this and in the previous century. It is, however, clear that most if not all of the new problems of humanity, the specific problems of the quality of life as well, can be resolved by more knowledge by a greater implementation of technology only. And we should not forget that the main problems for far more than half of the inhabitants of the world still remain hunger and property. Technological change is their hope. So, although it might sometimes sound very modern, maybe even "socialist", to proclaim "zero growth rate" or similar theories, let be stressed that the question of more or less growth, more or less technology, does not and should not exist. The question which does exist and which must be answered is: for what are the results of the economic growth and technologies to be used?

II

The fact that most of the socialist countries did not take part at the Stockholm Conference, and their reservation towards some other multilateral actions, is merely the consequence of international political relations. Those countries do not lack an awareness of such problems, whether they be called the protection of environment, the quality of life, and so on. Not only the governments, the people too, in Moscow, Prague or Wroclaw, as well as people in London,

[1] It is typical that the Stockholm Conference on the Human Environment was held under the slogan "Only one Earth". And it is typical too that one of the main controversies of the conference was between the developed and the undeveloped nations.

[2] Stockholm Conference (A/Conf. 48/9), p.13: "Of course, the practical solutions to these problems will be chosen, applied and received differently according to the political ideology which prevails. Several kinds of solutions are conceivable."

[3] A/Conf. 48/9, p. 13.

Essen or Chicago, feel the environmental crisis. They feel the troublesome and numerous consequences, so simply covered by these two words, ranging from pollution to alienation. The awareness of socialist governments to this "problematique" can be illustrated by the well-known speech of the deputy prime minister of the Soviet Government V.A. Kirilin, delivered to the Supreme Soviet on September 19, 1972, on "Measures for Better Protection of the Environment and Rational Use of the National Resources". And it is not probably accidental that the first treaty signed by Mr. Nixon in Moscow was the treaty regulating cooperation on environmental problems. In 1971 the COMECON countries signed a multilateral treaty on their cooperation on environmental problems and rational use of resources, which might be considered as the basic document regulating their cooperation. The treaty points out the fields of cooperation, divides the tasks among contracting countries and determines the coordinative centres for each field of activity. It can be concluded that the protection of environment is becoming one of the priority tasks of the governments of the COMECON countries.

The fact that in the socialist countries exists the social property of the means of production, the fact that the profit is not the ultimate goal of production, that governments in these countries possess the means of central planning, does not present only their characteristic if compared with the western political systems; it could also be an advantage in mastering the problems of our technological future.

III

Yugoslavia took an active part at the Stockholm Conference and is actively involved in the problems of protection of environment and quality of life in all international organizations in whose activities it takes part (OECD, EEC, COMECON). At the present time a general law on the protection of human environment is being discussed in the Yugoslav federal parliament. There are several governmental and self-managing institutions, on the federal and the republican level, whose tasks are to take care of the quality of life now and in the future. They can propose legal regulations, standards, etc., they propose the necessary research, they educate people. It is noteworthy that the constitutions of most of the Yugoslav republics include special amendments on protection of human environment.[4] However, as an undeveloped European country, Yugoslavia has to keep high growth rate, and try to escape mistakes of unbalanced growth made in some other European countries.

IV

Compared with the other socialist countries (and in some respects with the western countries too) the Yugoslav approach to the problems of protection of environment and quality of life would have the following main characteristics:

i. In Yugoslavia the human environment is considered the whole complexity of natural and social elements and relations which surround a human being. So, the natural environment is only a part of the human environment. The social environment is just as important a part of the human environment, if not even more important. The social environment is considered the complexity of relations of a person to other people[5]. It might be said that just this special attention paid to the deterioration of the social environment (problems of alienation; technocratic domination and manipulation, etc.) can be considered the main (though slight) difference to the approaches adopted by other socialist countries. They seem to pay comparatively more attention to the problem of natural environment.

ii. Of course, in Yugoslavia we consider the state to be an important partner in the protection of the environment. Nevertheless, we believe the active participation of individuals and groups of interested people to be the most important element in the decision-making process and action in protection of environment. Neither a private businessman,

[4] The amendment XXXII of the Constitution of the Socialist Republic of Slovania: "The working people and citizens have the right to live and work in healthy environment... The republic, the communes, the local communities and enterprises take special care to protect the environment... and to prevent deterioration of environment, caused by production... and traffic. The flora and fauna... the sea and the coast, rivers, streams, lakes and their shores, the water and air are under special protection of the society."

[5] The definition of the environment mentioned in the Stockholm Conference document A/Conf. 48/9, p. 7: "The environment is not, of course, a mere aggregate of natural conditions. It is both the imprint of the society which has created it, with its beliefs, myths and dreams; and it is the matrix of that society."

motivated basically by profit rates, nor a state bureaucrat, nor a modern technocrat, can replace the motivation and interest of each individual, and their active participation in protection of the quality of life. In most other socialist countries the role of the state and its organs is considered as dominant[6].

The Yugoslav self-management system, however, is not considered only as a mere method of participation, but it is also seen as a possible way of bringing each individual closer to general affairs. We see in it a possibility to overcome those aspects of quality of life, which are usually known as problems of alienation. We consider that in the technological future it will be possible and necessary to abolish the decision-making "on behalf" of the people, without active participation of those "for whom" the decisions are made.

V

The technological future comes with its promises and fears to the industrialized socialist countries, as it does to the western democracies. Both parts of the industrialized world will have to prove in the coming decades their capability to resolve new problems. And as the problems are mainly common the implications and practical solutions might sometimes be more similar than they appear to be at the first sight. In a broad ideological sense it could be considered that systems, based on human solidarity and general interest, seem to be an advantage, compared to those mainly based on profit and private interest[7].

The future, which we want, should not be the future of materially rich people, who are enslaved and manipulated by technocratic organizations. It should be the future in which material goods and human knowledge will be used by man in order to make him more humane. This future should include much more human solidarity, much more respect and freedom, much more material and legal security. To achieve this, very deep changes will have to take place in all countries of the industrialized world[8]. The "profit" and the "state interest" will have to be replaced by real general interest, which include the balanced growth. The inclination to absolute efficiency will have to be corrected by a greater respect for each individual and his social relations. For we do not live to produce, but produce to live better. The short term market efficiency will have to be replaced by a long term evaluation of efficiency, measured from the social point of view. The state's central planning as well as the technocratic planning will have to be replaced by social planning, which will present general agreement of people on common goals and common action. Let it be added that long-term planning in Yugoslavia tends to achieve new social relations and not only material richness. We do not only want to be rich, we want to be more secure, more happy. The representative, indirect democracy will have to be replaced, as much as possible, by direct decisions, made by interested people. General political representation, prevailing in the Western parliamentary political systems, as well as the dominant role of the state bureaucracy prevailing in the Eastern European countries, will have to be replaced by new forms of social and political life, organizations and institutions.

Natural resources will have to be used much more carefully. Pollution should not be caused in those parts of the globe which are not yet faced with it. It is the responsibility of the whole world, and especially the responsibility of the industrialized part of it, to help the developing countries not to repeat mistakes made in Europe and North America. In research and education the highest priority has to be given to the problems of human environment and use of natural resources.

It might be said that humanity faces a situation, difficult indeed, in which our level of technology requires a new way of life and new values – neither of which is yet reflected in the human conscience.

[6] It is interesting to mention the Stockholm Conference attitude (A/Conf. 48/9), p. 24-25: "Individuals, in isolation or in organized groups, have an active political part to play in keeping with the elementary requirements of democracy. Firstly, by bringing pressure to bear on the political leaders they can cause decisions to be taken and see that they are carried out. Secondly, by behaviour as well-informed consumers they can head off production trends harmful to environment. Lastly, they can participate directly in the protection or improvement of the environment by taking the initiative in monitoring and in arousing public opinion... In whatever field it chooses to intervene, the state clearly plays the decisive role as regards environment. The actions of each state within its national jurisdiction will take the most varied forms, according to its own distinctive political inspiration."

[7] Stockholm Conference (A/Conf. 48/9), p. 13: "No clear choice can be made and no effective action can be taken without reexamining the decision-making structures at all levels – local, national and international – in order to ensure that the policies to be applied reflect in all cases, not the will of a group however powerful, but the general interest."

[8] Stockholm Conference (A/Conf. 48/9), p. 13: "As regards the environment in which we wish to live, defining the available options and making a selection from among them entail making a set of fundamental social and cultural choices and remaking each country's plans for civilization."

VI.

POLITICAL IMPLICATIONS AND THE ROLE OF GOVERNMENT IN THE PLANNING OF TECHNOLOGICAL FUTURE IN THE SOCIALIST COUNTRIES

Eugeniusz Olszewski, Lech Zacher (Poland)

In a recent paper by Dr. A. Peccei, one of the founders of the Club of Rome, we read:

> "The present crisis in society cannot just be blamed on technology and on the science which gave it birth. It is rather man's wisdom which has been lacking, his lack of sense of direction in his probing for new knowledge and the absence of control and management of technology."[1]

Indeed, mankind's technological future, as well as the future of highly industrialized countries now entering the period called the scientific-technical revolution,[2] depends only to a limited extent upon the development of the world's technology and of the science involved in it. It depends also, and perhaps to an even greater extent, upon the employment of such technology and the way this is realized. This involves various decision centres in all societies.

In countries governed by a market economy, industrial enterprises, including domestic and international corporations, take decisions in accordance with their interests in competition with each other. Others at this consultation will speak about the political implications, the possibilities and the significance of government policy in such economies. It will be up to them then to judge whether and to what extent this type of economy is responsible for what Dr. Peccei calls "the absence of control and management of technology".

The task we set ourselves in this paper is to describe the aims and methods of shaping the technological future of countries with a planned economy; where both the role and responsibility of governments for the direction and the realization of technological policy follow from the basic principles of that economy.

Since technological policy is part of general social and economic policy, the technological future of a given country, a group of countries, or of mankind as a whole, should be subordinated to the broad aims of social policy. In socialist countries, such aims depend upon the image of the future Communist society envisaged by the Marxist ideology, and upon the current social, political, economic and cultural situation of particular countries.

A Communist society will follow the principle formulated by Marx himself: "Each member working according to his capacity and receiving according to his needs." Interpreting this formula, Engels explained that it was aimed at satisfying everybody's reasonable needs.[3] Thus the extent to which needs are to be satisfied should be determined by their rationality; this includes the limitations, resulting from the possibilities of producing material goods and services in the given period as well as the limitations following from equal rights for all members of society, that is to say from the inadmissibility of satisfying one's wants at the expense of others, whether of the same or of future generations.[4] Such a limitation may be extended also to spiritual needs: the development of one man's personality should be limited so as not to restrict the development of the personality and dignity of others.

One of the essential needs of a member of a Communist society is for creative work, through which he contributes to the common good while making the fullest use of his capabilities and talents. One of the essential requirements of social progress is such an organization of a man's work and, even more, of his attitude in the process of production, that he should be able to achieve the fullest development of his personality through his work. And such work, while

[1] A. Peccei, *The Club of Rome – The New Threshold.* Paper read at the Symposium "The Scientific-Technical Revolution and the Maintenance of Peace", Vienna, March 29-31, 1973. Typescript, p. 11.

[2] R. Richta et al., *Civilisation au carrefour,* Paris 1969; cf. also: E. Olszewski, "Les sciences et les techniques dans la période de la révolution scientifico-technique", in *Organon,* annual published by the Polish Academy of Sciences, no.8, 1971, pp. 43-44.

[3] cf: F. Engels, Karl Marx, *Volkskalender,* Braunschweig, 1878.

[4] The authors of the well-known report prepared for the Club of Rome also call for a rational restriction of needs. Cf: D.H. Meadows, D.L. Meadows, J. Randers, W.W. Behrens III, *The Limits to Growth. A Report for the Club of Rome's Project on the Predicament of Mankind,* New York, 1972, pp. 163-188.

becoming more and more creative, should give increasingly the sublime and disinterested satisfaction of the kind which, one can find, according to many writers, in scientific or in artistic pursuits.[5] This does not mean, of course, that work should become a game. But as Julian Marchlewski, the distinguished Polish Marxist economist and political leader, has written, "If socialist society shows itself unable to organize work in such a way as to make it a pleasure, the whole thing will end up in failure".[6]

Hence the creation of a Communist society requires a growing automation, whereby the very character of man's work will be changed;[7] it also calls for such a high level of general satisfaction of material needs as to make man free to develop his personality, to give expression to his spiritual aspirations, and to raise the quality of his life. The development of technology should, therefore, be directed to, among other things, the creation of such conditions as will favour the appearance in man of aspirations and motivations, now still far from general; conditions in which the man of the Communist epoch will be formed.

It follows that the aim of technological policy in a socialist country is the development of technology which will secure, in the shortest possible time, a rational degree of satisfaction of people's wants; and which will simultaneously change the very character of man's work by freeing it, through complex automation, from its dependence upon the action of machines. Thus, during the coming decades, technology may be expected to develop exponentially in the socialist countries, allowing of course for limitations resulting from the exhaustion of raw materials and from the need to protect human environment. Only in a more distant future is it possible to foresee the slowing down of the rate of quantitative growth with a stronger emphasis being laid upon quality.[8]

The immediate aims of technological policy must depend upon the current situation of the country or a group of countries. For instance, the rapid technological development of the Soviet Union in the nineteen thirties was aimed at the fulfilment of people's needs and at a building up of the country's military strength enabling it eventually to beat off the Nazi invasion, and – in alliance with other countries – to destroy the power menacing the world as a whole. Similarly, after the Second World War, particularly in the cold war period, the socialist countries had to stress defensive aims.

In recent years, the technological progress and economic development of socialist countries have given rise to new dialectic contradictions. The wide application of material incentives, indispensable for a quick development of technology, a rapid growth of production and an increasing fulfilment of people's needs, leads them to accept the view that the satisfaction of material requirements is the sole aim in life. Such attitudes are sustained, moreover, by the patterns of social behaviour prevailing in the capitalist countries. Such contradictions are not always antagonistic, but they make it necessary to pay special attention to ideological instruction, among the young in particular, in order to cultivate an awareness that the increasing satisfaction of social needs is not the ultimate aim, but rather a means by which the future Communist society is to be built.

Hence Marxist ideology approaches technology in an optimistic manner. It is technology that plays a substantial role in preparing a Communist society. However, technological determinism is rejected because technology plays only a subordinate part in social development and should therefore be both stimulated and guided according to the aims of that development. It follows that the results of technological progress are not and will not be the same in various countries, and especially in countries unequally developed and with different social systems. That is why the theory of convergence, according to which because of technological progress countries with different social systems converge in the course of their development, is simply illusory.[9]

It follows from what we have said so far that in the socialist countries the strategy of technological progress constitutes an essential element in the wider strategy of social progress. It is linked most closely with the strategy of economic development; it increases the efficiency of labour, the modernization of products, and competitiveness in international markets. It is also connected with many elements of cultural policy, since it fashions new models of goods and

[5] cf: J. Offray de la Mettrie, *L'homme machine,* Leyde, 1748, Dedication; J.F.W. Herschel, Preliminary Discourse on the Study of Natural Philosophy, London, 1830, Part 1, Chapter 1, Point 1; B. Russell, *The Autobiography 1872-1914,* London, 1967, Prologue.

[6] Preface to the Russian translation of the book: C. Ballod, *Atlanticus. Der Zukunftsstaat,* Moscow, 1920, pp. VII-VIII.

[7] Re the significance of automation compare: E. Olszewski, *op. cit.,* pp. 50-53.

[8] There is here a certain similarity to recommendations made in the report for the Club of Rome, referred to above. However, this report while giving an absolute importance to the limitations resulting from the exhaustion of resources and the pollution of environment, regards technology as a factor independent of social factors; and hence does not consider the social factor in technological progress. Moreover, while concentrating on quantitative problems, the report leaves out, almost completely, the problems of quality of life. Cf: E.F. Schumacher, "Implications of the Limits to Growth Debate – Small is Beautiful", *Anticipation* no. 13, 1972, pp. 12-17.

[9] Cf: L. Zacher, "Zmiany techniczne a przemiany strukturalne i spoleczne – uwagi futurologiczne" (Changes in Technology and Structural and Social Transformations – Futurological Remarks), *Humanizm Pracy* (The Humanization of Labour), bimonthly published by the Polish Academy of Sciences, no. 5-6, 1971.

services and thus influences the emergence of new socially valuable patterns and models of life; it also plays a large part in a country's defensive strength. And the strategy of technological progress itself depends to a considerable degree upon such factors as the size of a country and the level of its economic development, its social system and links with other countries, the state of its general and vocational education, and the like.

Technological policy also includes the concern for technical research and of development, necessary for the acquisition of new technological ideas, the adaptation to local needs and to technological conceptions arrived at in other countries and under different conditions; it also includes the policy of technical realization which determines the implementation and spreading of technological conceptions in the economy itself.[10]

In particular countries we can distinguish three types of strategy for technological development, the choice depending upon, among other factors, the size of the country and the level of its technology. The first type consists in the exploration of "terra incognita", the blazing of trails for the progress of civilization; the second, filling the gaps, that is to say in getting hold of the fields that have been unnoticed or intentionally overlooked by others; the third, the development of the fields which have reached a higher level in other countries.[11]

The first type of strategy requires vast resources of material and cadres in the sphere of applied research and development, as well as in the field of fundamental research. Only large, highly developed countries can afford this kind of strategy. Among the socialist countries only the Soviet Union can apply it at present. Even the richest countries are unable to apply this strategy along the whole front of existing technology. Concentrating on selected priorities, they leave certain sections of concern "unoccupied", which creates those gaps that may be filled by the strategy of the second type. This second type is applied – or is beginning to be applied – by the European socialist countries. The agreements they arrive at in this respect, while acting within the framework of COMECON, assign to each member country a separate section of activity. The third strategy, the imitative one, following the beaten tracks, is characteristic not only of the developing countries, but prevails also currently in medium industrial powers, including, among others, socialist countries like Poland.

The strategies of the first and second type imply a vertical movement of innovation: from fundamental to technological research and to development; the strategy of the third type, on the other hand, is noted for a horizontal flow – from one country to the other, or from one branch of technology to the other. The resarch and development potential is being used in that case above all for works of an adaptational nature.

The imitative strategy was used by the socialist countries when they were endeavouring to raise themselves out of their economic backwardness, worsened for many of them by the destruction caused by the Second World War. The new phase in Poland is marked by the following symptoms: an increased importation of technology, the development of industrial cooperation with highly developed capitalist countries, as well as the growing importance of joint research programmes and joint industrial undertakings within the framework of COMECON. Application of this line will enable the country to take part in the scientific-technical revolution.[12]

In the socialist countries general guidelines on social development, especially in the sphere of economy and technology, are contained in the programme of action agreed upon by the congresses of the Communist parties.[13] These parties are able to ensure in this and other ways, that actions concur with the general guidelines of social development which follow from the ideology; and at the same time that these actions correspond with the needs and requirements of the population. The programme thus established is then carried out by the government, acting under the control of the party leadership and of the parliament. By showing the nation the prospects of development for the years to come, the programme mobilizes citizens and creates at the same time a political framework for the long-range plans being drawn up by the government. The basic lines of which are then voted on by the parliament.

The long-range plans constitute the basis for the one-year plans, drawn up by the government and voted by the parliament. The body which prepares the annual and long-range plans in Poland is the Planning Commission of the Council of Ministers. It is also currently working on a prospective plan for the period up to 1990. The research and prognostications involved in this work are being handled by the Committee on Research and Prognostics, "Poland 2000", of the Polish Academy of Sciences.

[10] Cf: E. Olszewski, "Etudes sur l'acquisition des techniques par les pays non-initiateurs". Paper read at the Symposium Utilisation des techniques nouvelles dans les pays en voie de développement – fin du XVIIIe-XXe siècle", which took place in Moscow, 1971, within the framework of the 13th International Congress of History of Science. "Acta" of this Congress are in press.

[11] Cf: Z. Madej, "Strategia rozwoju techniki" (The Strategy of the Development of Technology), *Nowe Drogi* (New Ways), monthly published by the Central Committee of the Polish United Workers' Party, no. 10/1972, pp. 119-124.

[12] Cf: Z. Madej, *op. cit.*, pp. 125-132.

[13] For instance, the Sixth Congress of the Polish United Workers' Party, held in December 1971, published the resolution "For the Continued Socialist Development of the Polish People's Republic". Cf: *Nowe Drogi* (New Ways), no. 1/1972, pp. 138-185.

The plans for technical development, which guide the technological policy, are subordinated to the general plan of social development, and so they are placed at the second grade in this hierarchy.[14] The plans for the realization of technological achievements in various fields of national economy are prepared by the respective ministries, and, as far as research and development are concerned, by the Ministry of Science, Higher Education and Technology, which also carries out the technical and scientific policy based upon these plans.

The main concern of this policy in recent years has been to increase and make the right use of the research and developmental potential. Special attention is given to works "with a complete developmental cycle – that is, stretching from research to practical application and including all tasks indispensable for the achievement of the ultimate objective which is as a rule utilitarian, socially useful". For work of this type "it is necessary to have complex coordination plans worked out with accuracy sufficient to synchronize them with economic plans when it comes to the practical application of their results in economy. It is usually assumed with regard to long-range plans that they should be accurate to within one year in relation to their finalization."[15] It is assumed that in industrial research institutes no less than 50% of the time should be devoted to such work.

Considerable importance is also attached to "the closest possible link between on the one hand the cycle of research and developmental work, on the other – practical application and popularization", because "the experience of many countries, including Poland, shows that practical application and popularization are the least efficiently operating links of the developmental cycle".[16]

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The purpose of this paper has been to present only the basic principles and methods of planning for the technological future in socialist countries. There was insufficient space, for the authors to discuss or give some examples both of the great achievements in this sphere, and of certain failures, which – as happens in any human activity – can be put down either to reasons beyond control, or to shortcomings and mistakes of those responsible for the planning of technological development and the fulfilment of these plans.

[14] Re the hierarchical structure of aims and plans in a socialist economy compare: O. Lange, "Political Economy", Vol. 1: *General Problems,* Oxford-Warsaw, 1963, pp. 179-180.

[15] J. Kaczmarek, "On Principles of Science Policy. Problems of the Science of Science", second special issue of the Polish quarterly, *Zagadnienia Naukoznawstwa,* published by the Polish Academy of Sciences, 1971, p. 19.

[16] J. Kaczmarek, *op. cit.,* p. 29.

VII.

THE RELIGIOUS FACTOR IN THE HISTORY OF TECHNOLOGICAL DEVELOPMENT

THE AMERICAN EXPERIENCE

A. Hunter Dupree (USA)

The Americans, the people of plenty, have always had a special feeling about their technology. Borne by ships across the wide ocean, the European immigrants had by the voyage which made them Americans an intense experience with a complex technological system. Their settlements had put a premium on the selection of those components of long standing European technical traditions which gave them the best adaptation to their new territory. American technology, like American religion, was a culture brought from an older world. Much of the comment on American culture has noted innovation, but continuity is also a strong characteristic. Lynn White, Jr., who always takes a fresh view, might if he were here stress the continuity, as he did in a playfully serious article entitled "The Legacy of the Middle Ages in the American Wild West".

Even in the late nineteenth century, when the United States took its place among the industrial nations of the world, the Americans borrowed much of their technology from Western Europe, adapting it in novel ways to their expansive continental setting. The wealth of resources, and the imperial distances made the United States gain strength easily, but technology dictated the breath-taking rate of change and impact on the fabric of culture. Religious values of many strands were woven into that fabric also, but as American industry grew in scale and power, technology itself became a value which many Americans prized to the point of earning the title "materialistic civilization" for their restless activity.

In those same years of the late nineteenth century, however, other Americans were labouring more humbly to create a scientific tradition in the United States. With the triumph of Darwin and the spread of his ideas at many levels in American society, with the development of institutions to provide a home for research, science gained enough status to take a public place in American culture. Indeed, if one were making a catalogue of the major religions in America, the religion of science would have to be listed as a major faith by 1900. Indeed, the American universities, which scarcely existed when Charles V. Eliot became president of Harvard in 1869, had by the end of the century become a whole set of well-supported and intellectually active temples of learning.

The American university as an institution was not the product of logic but rather contained the amalgamation of two traditions of technology and science. The universities led to the ideal of research, scientific truth, and progress by increasing specialization at the expense of older and broader views of learning. At the same time the universities developed agricultural and engineering schools with practical goals to be attained by scientific means if possible, but craft means if necessary.

The period after 1900 in the United States is often called the "progressive era" and one work on this period refers in its title to the "gospel of efficiency". In that prosperous and vigorous time before the First World War it seemed as if the Americans might be on their way to bringing into being a material heavenly city which would avoid both the hard choices of the economics of scarcity and the hard choices of religious traditions which recognized the reality of evil. A progressive technology was on the side of the angels, and the religion of science gave a beneficent direction to it and a standard of truth which no revelation could match. Only a few observers watching from outside the mainstream of activity – Henry Adams was one – questioned the coupling of science and technology into a progressive and characteristically American faith.

Even the older religious traditions largely assimilated the twin faith in technological progress and the religion of science. The only significant exception, the only true counterculture which the United States has produced was the South. Only there did the warfare of science and religion become a serious issue which continued into the twentieth century. Everywhere else it was possible to mix, in varying degree, the belief in science and progress with other religious traditions. The Social Gospel might point to inequalities and tensions of the cities and even edge toward Christian Socialism, but it did not question seriously the religion of science and progress. If tradition resisted too strongly, the alternative church in the form of the new universities, secular but infused with high dedication to scientific truth, offered a place of worship for the agnostic technical specialist.

Neither the First World War nor the Great Depression called forth a serious questioning of the religion of science and progress. Indeed these episodes seemed to Americans as merely an interruption in the flow of progress which called forth only renewed devotion to the deferred ideals. The kind of questioning of the grounds for belief in science which swept Weimar Germany in the 1920's was largely absent from the United States. The refugee scientists, who left Germany after 1933 and ended up in American universities, found their hosts who welcomed them excellent experimentalists and indeed well-educated in quantum mechanics but extremely uncomplicated in their view of the possibility of evil in the world. Indeed some of the leaders of American physics in the 1930's and 40's were evangelicals of almost nineteenth century purity. Robert A. Millikan and Arthur Compton among the American Nobel laureates had no trouble in combining a belief in science, evangelical Christianity, and American democracy without the slightest strain.

Against this background the reaction of the American scientific community, once aroused to action in 1940 by the prodding of the refugees and the logic of the crumbling of the international order, was characteristic. The leaders did not hesitate in their belief in the religion of science. Indeed they saw Hitler as a major threat to that religion, a danger too immediate to be combatted by the slow and indefinite pursuit of pure truth in universities removed from concern with the world. The leaders also believed in American technological ability, with one significant exception. Weapons technology had never been a major target for American innovators, and in the interwar period the professional military men had not distinguished themselves in the eyes of the scientist. Therefore in the hectic days of June 1940, as France fell the leaders of American science – university science of the very purest kind – threw their resources into a desperate bid to overcome the military weakness of Britain and the United States in comparison to Hitler. Their determination was driven by fear, for even though they believed that science and freedom went together, decades of veneration of German research-based technology gave them the nightmare of an atomic bomb in demonic service of the Nazis. Five years of intense effort harnessed science to those areas of technology which were relevant to warfare. Weapons included not only the atomic bomb but an epoch-making effort in medicine and the creation of an electronic environment for warfare.

When the world began to get a picture, in 1945, of what the allied scientists had done during the war, the reaction was a mixture of admiration and horror. The old easy alliance of the religion of science and technological progress was no longer innocent.

The admiration would bring public support and the creation of great research centres, well-funded laboratories and large numbers of young scientists whose education had been financed by the government. The term "research and development" now signified a recognized category of national expenditure in the United States. A whole set of government agencies, largely uncoordinated among themselves, vied to support the ablest investigators, who tended to congregate at twenty or so universities which became the centres of an unprecedented volume of research. Since many of the wartime leaders had been very young in 1940, they guided the system of science support until well into the 1960's. The conviction that great problems could be solved by technology in the hands of scientists seemed almost unshakable.

The dark side of this new position of science and technology was also apparent in 1945. Robert Oppenheimer could say that for the first time scientists had known sin, and the spectre of nuclear war troubled many, some scientists most of all. The *Bulletin of the Atomic Scientists* carried on its cover the face of a clock, and as the Cold War deepened, the hands moved up to three minutes before midnight. Even while the nuclear holocaust threatened, however, the scientists gave evidence of not really believing in its reality. They worked with great efficiency, if not with their wartime zeal, to perfect the nuclear arsenal and its delivery systems. Their unspoken bargain with the government was to give their indispensable services to the military in return for the generous support of science generally. As the balance of terror fluctuated toward equilibrium, even the hands of the clock moved back to seven minutes before midnight. By

the early sixties the American scientific establishment seemed to have achieved a secure and growing role. The sin of the bomb had not, after all, threatened seriously the religion of progress and science. The terror of the bomb became almost conventional, its hypnotic effect blocking out other threats while eventually lulling the observer to sleep.

For me personally the rude awakening came when the university I then served – the University of California, Berkeley – on a certain day in September 1964 lost its ability to govern itself. The university was so secure in its faith in its own stability that no one suspected it had a structure as a community, much less did we suspect that its legitimacy could be even temporarily destroyed. Yet the Free Speech Movement mounted a challenge to science that was ultimately to reach not only Columbia and Harvard but also Paris and Berlin.

To any who listened to the oratory on the plaza in Berkeley during the fall of 1964 the challenge to science stood out almost as clearly as the challenge to a technology harnessed to weapons and to the hypocrisy of the establishment. These nightmares were not the simple fear of nuclear annihilation. That fear actually receded into the background. It was no longer necessary to consider the University of California sacrosanct in order to protect the nuclear shield of the free world. Whatever the merits and the fate of the political movement which swept through the universities in the 1960's we are concerned here only with the moral challenge to science and technology articulated by what came to be called the counterculture. One kept expecting in Berkeley that the challenge would be answered by Nobel Prizemen coming down from the mountain and saying: "The religion of science is still the true faith. Its truth is honest and disinterested, and in the long run both science and technology will prove, as they have so often in the past, among the highest attributes of our humanity." Why was not such a reaffirmation of faith forthcoming? Distraction, fatigue from the normal working of the system, subtle changes in the political and social climate, weaknesses in the political structure of the universities and their support system all played a part perhaps. More likely there is a simpler explanation. The challenge to the political structure of science was not strong enough, coherent enough, and threatening enough to frighten the leaders of the scientific community into direct moral discourse with its critics. Since the seventeenth century scientists had in obedience to a higher law of reason denied themselves the luxury of disputation on politics and religion. Now they lacked the habit, the tradition of civilized discourse, even the vocabulary for a serious discussion of their moral responsibilities.

The counterculture thus had a free field for criticism of all the ills of modern industrialized society as stemming from its lack of human scale. Technology, with science as its slave, emerged as the darkest force of industrialism hypocritically masquerading as progress. The standard of truth itself was to be found not in the cold dimensions of matter but in personal authenticity and emotional expression. The price to be paid for technological progress was the enslavement of the spirit the desecration of the environment, the fragmentation of man. To fight against the cage of Cartesian coordinates which imprisoned the globe was impossible unless one brought down the whole political and social establishment. The Vietnam War rolled all of these strands into one great affront to man, society and nature.

The criticism of uncontrolled technology spread far beyond the radical groups who first articulated it and the theorists, Theodore Roszak for example, who developed it. The very luxuriance of its expressions – the dress, the beards, the sexual customs, the drugs, the toying with Oriental religions – made it not a movement but a vague shift in cultural climate. At its worst it depended on the mass media and the public relations tricks of the hated establishment and applied them cynically to the destruction of liberal institutions which had been lifetimes in the building. Its demand for personal authenticity was so absolute that it made tolerance of most of American culture including science a deadly sin. It was long on outrage and short on constructive alternatives. At its best it aspired to a human scale for culture, including technology, and an ideal of life in harmony with the environment. It abhorred the abstract and heartless application of force by an efficient technology in the service of ideology. Above all, it spoke for the voiceless victims of modern war. It had an almost old-fashioned admiration for handicrafts and a parochial society, oblivious of the global technology of space and energy.

The old easy American alliance of the religion of democracy, the religion of technological progress and the religion of science received an unprecedented shock from these criticisms. As the 1960's wore on, such would-be defenders of the great aspirations of the faith consistently lost their ground as illusions of the goodness of some of the most cherished institutions crumbled. The American presidency which had been on the side of the triple faith against the forces of local corruption and especially had fostered the growth of the great science agencies in the government, now showed signs of gross irresponsibility in foreign policy and in building up conventional armaments for casual uses that would have been unthinkable earlier. Finally, the presidency itself turned on science and begrudged it support. The counterculture thus found itself a powerful ally in President Nixon, whose administration insofar as it has had a policy

other than punishing the universities by cutting research, deliberately undercut the religion of science in favour of a lip service for practicality which left technology largely to businessmen. The efforts of the friends of science to get some hold on policy has thus taken the form of the technology assessment movement.

The history of the years since 1969 is too close and complicated for exposition here, but we can venture a cautious defence of some aspects of science that will not please either the spokesmen of the counterculture or the official leaders of the scientific community. The discrediting of one of the world's great religions is always dangerous. The problem with the religion of science was not in the scientific tradition but in the arrogance implied in codifying it as a religion at all. Many of its values derived from the noblest strands of Judeo-Christian tradition. Only when one demands a confession of faith the result is then a covering up of the store of many traditions which entwine under the name of science and which in unexpected ways provide resources for meeting unforeseen problems. The scientific community has indeed since 1940 accentuated the concentration of technological power, but it has also provided some of the most effective checks on that concentration. Scientists have led the opposition to biological and chemical warfare, have stood for arms control against the Department of Defence. The scientific community has a long history of concern for the environment, and any adequate movement to evaluate the interplay of technology and environment must be informed by research which is yet to be done.

In a larger way, if one demotes science to the status of a social activity, it is possible to see it as the creation of man rather than of the devil. A set of minority traditions in biology, the social sciences, linguistics and even in physics, are now converging on a reordering of the simple positivism that has reigned in America unchallenged until recently.

It is easy to confuse the signs of a new humane science with the continuation of oppressive and mechanistic invasions of human privacy. Computers, even the most sophisticated ones, are too crude a parody of human intelligence to teach us much. Jay Forrester mangles social reality as he tries to put world dynamics into a simple programme. His model is designed to blow up. Systems analysis and game theory bear some responsibility for the cumulative immorality of the Vietnam decisions. Information theory quantifies a message without touching its meaning. Cybernetics raises the spectre of automatic control displacing humans from their proper dignity-giving work. The elaboration of the genetic material, DNA, seems a triumph of reductionism and an invitation to tampering with the human species, a prospect chilling to man if one is a humanist and insulting to God if one adheres to a traditional religion.

Out of those tendencies, however, we sense a change of outlook as yet ungeneralized which would usher in a new period in the history of science. Glimpses appear in the pages of Piaget and Levi-Strauss. Digging in the voluminous works of Talcott Parsons yields strands of system in society which provide a place for religious values. A new science of man and nature is struggling to be born. For a prophet to hail this new science as a new religion is to condemn it in advance to *hybris* and ultimately to overthrow. To wait for it to emerge out of the rich store of scientific culture is to look to the only likely source of unthought-of solutions for problems yet unanswered. The religion of science has failed to impose humane value on a refractory world, but a culture permeated by humane values can use its scientists to humane ends. The development of a single global technological network which can be controlled only by people of high intelligence at many local stations has in it the threat of technological tyranny but also ecumenical brotherhood. The hope for humane value is tied to a humbling of the pretensions of the religion of science but even more importantly to the flourishing of science as one element among many in the matrix of culture.

VIII.

THEOLOGICAL AND BIBLICAL RESOURCES FOR COPING WITH MEANINGLESS SUPER-POWER

Ellen Flesseman-van Leer (The Netherlands)

I. LA CONDITION HUMAINE

Genesis 4:1-2, 17-26

(1) Now Adam knew Eve his wife, and she conceived and bore Cain, Saying, "I have gotten a man with the help of the Lord". (2) And again, she bore his brother Abel. Now Abel was a keeper of sheep, and Cain a tiller of the ground... (17) Cain knew his wife, and she conceived and bore Enoch; and he built a city, and called the name of the city after the name of his son, Enoch. (18) To Enoch was born Irad; and Irad was the father of Me-hu'ja-el, and Me-hu'ja-el the father of Me-thu'sha-el, and Me-thu'sha-el the father of Lamech. (19) And Lamech took two wives; the name of the one was Adah, and the name of the other Zillah. (20) Adah bore Jabal; he was the father of those who dwell in tents and have cattle. (21) His brother's name was Jubal; he was the father of all those who play the lyre and pipe. (22) Zillah bore Tubal-cain; he was the forger of all instruments of bronze and iron. The sister of Tubal-cain was Na'amah.

(23) Lamech said to his wives:
"Adah and Zillah, hear my voice;
you wives of Lamech, hearken to what I say:
I have slain a man for wounding me,
a young man for striking me.
(24) If Cain is avenged sevenfold,
truly Lamech seventy-sevenfold."

(25) And Adam knew his wife again, and she bore a son and called his name Seth, for she said, "God has appointed for me another child instead of Abel, for Cain slew him". (26) To Seth also a son was born, and he called his name Enosh. At that time men began to call upon the name of the Lord.

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Along story lies behind this passage of the Bible. An unknown writer and great theologian, whom we designate by the letter J (abbreviation of Jahwist) and who must have lived around 950 B.C. has combined three different traditions, which existed already independently before his time.

Verses 17-22 come from one tradition, to which 1a and 2b probably also belonged; they were part of a genealogical list. A genealogy is the oldest form of historiography. These verses describe the primeval history of mankind, which apparently is viewed here as a history of culture. The first link in the genealogical chain is Cain, who stands for that branch of mankind which as farmers live a settled life (v. 2), that leads in due time to the building of cities (v. 17). V. 20 mentions the second branch of early mankind, those who as nomads dwell in tents. It is from among them that music, or, more generally speaking, the arts arose, as did also the use of bronze and iron – that is, technology originated there. There are three aspects of this tradition to which I want to draw your attention.

1. This old tradition expresses the conviction that the origins of culture go back to the very beginning of mankind, Israel has always understood itself as having come late on the stage of history and as having inherited its cultural goods from the nations around it. According to this passage culture is, in the literal sense of the word, inter-nation-al.

2. There is no indication that this tradition saw the development of culture in a negative light. On the contrary, we rather get the impression that it evaluated positively the various cultural attainments. The building of a city is described in a matter-of-fact way with no trace of pastoral romanticism. The same is true of human art and technology: they too are part of historical progress. It is to be noted that, in contrast to comparable Egyptian and Sumeric texts which name the institution of the monarchy, no mention is made here of any political structure. In Israel, cultural achievements were apparently considered as of greater importance than political institutions.

3. The various cultural goods, such as the city, arts, and technology, are regarded as purely human attainments. The importance of this aspect becomes manifest when the passage is compared with the legends and myths of other peoples. In the Prometheus-myth, for instance, the fire, symbol of culture, has to be stolen from the gods, who want to keep it to themselves; in Egyptian myths it is the gods or demi-gods who teach man the various cultural skills. But in Israel's conception it is man himself who develops culture; man is essentially a culture-creating being. Thus culture, art, and technology are de-sacralized and given into the power of man. The so-called song of Lamech in v. 23-24, which once formed an independent unit, belongs to another tradition. Similar old songs are also found in Arabic literature; their intention was to deter one's enemies by showing off one's strength. There can be little doubt that this Lamech song was such a 'taunt-song', and that it was originally transmitted with a feeling of awe and admiration for the pride and self-reliance of the "strong man", who threatens the most terrible vengeance for the smallest slight to his honour. It may well be against exactly this sort of excessive vengeance that in later times the adage, "An eye for an eye, and a tooth for a tooth", was directed.

By combining the Lamech song with the genealogy, J changed subtly and profoundly the meaning of both. Culture in itself is a positive and essential part of being man – but this same culture gives rise to brutality. Hence these two traditions taken together express a certain basic ambiguity of human existence: human accomplishments belong to the development of mankind, but man seems almost fated to use them for his self-aggrandizement, so that they become detrimental to his fellowman. The more man is able to do, the more dangerous he becomes.

Finally, v. 25 and 26 belong to a third tradition. They seem to be the remains of another genealogy. The original purpose of this genealogy alongside the former one is no longer clear, because only its very beginning has been preserved. But its importance to J may well have lain in the words of v. 26b: "Men began to call upon the name of the Lord". At first sight these words seem surprising, for it was the general belief of Israel that the Jahwistic religion went back to Moses. Therefore, irrespective of what these words may have meant originally, cannot have wanted to imply that at that early time men already called God by his name of Jahweh. Rather, with this "calling upon the name of the Lord" he pointed to the most basic religious act of man, in which he turns to God in prayer. The ages before God revealed himself to Israel as Jahweh were not God-less, for in that time too men turned to him. For turning to him and calling upon him are essential to being man, as essential as man's capacity to produce culture. That is to say: religion belongs to the nature of man as he is created. And religion is somehow always directed towards the God of Israel – for that is the only God there is.

In his composition the writer made verse 26 follow right after the song of Lamech, thereby illuminating again the ambiguity of the human situation. The Lamech song described the disruptive, negative element in mankind; but in and together with this sinful aspect of existence, there is also, as a saving feature, the tie between God and man, as evidenced by man's calling upon God.

The passage we have analyzed is, as it were, a duplicate of the story of the creation and the fall of man in Genesis 2 and 3. As such it proves – if proof were still necessary – that the writer did not take man's creation and his fall as two successive stages of history. Rather he pointed in those two stories together to *la condition humaine,* as it had become transparent for him in the light of his faith. It is good to be man, for man is created and well equipped with all his capacities and possibilities by the good God. That insight is conveyed in Genesis 2 and elaborated in Genesis 4:17-22. For the development of man's cultural and technical skills is but an unfolding of the divine commandment, given to man in Genesis 2:15, to till and keep the garden of Eden. This same man destroys the good creation by transgressing his rightful human possibilities. He wants to be super-man and thus becomes less than man. That is the story of Genesis 3, which is repeated in the song of Lamech. But even in his sub-humanity man's tie with God is not cut, and the goodness of life still shines through. In Genesis 3 we are told that God has put eternal strife between the serpent and man: that is punishment, but also promise that man will fight against evil and not passively submit to it. Childbearing will be painful, but even so children will be born and life will be allowed to go on. Man is expelled from Eden and existence is hard, but still he can till the ground and unfold his human capacities. The words of Genesis 4:26, "and man began to call upon the name of the Lord", take up the confidence of Genesis 3, that also in its disruption human life is kept and surrounded by the care and the love of God.

Prayer:
Dear God, we thank you that you will keep and hold us, even when we turn away from you. Help us that we may use the great human possibilities you have given us, in such a way that they do credit to you, and that we do not ruin irretrievably the beautiful earth you have entrusted to us.

Lord, be with us today in our work, in our thinking and speaking, and when we listen to each other. Give us the right modesty, and give us also the right joy and the right pride that we are allowed to be men, together with you and before your face. Amen.

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II. THE NEXT SMALL STEP

In the beginning of the sixth century B.C., the Babylonian king Nebuchadnezzar had conquered the entire Middle East. He had also taken Jerusalem, destroyed its temple, and deported the leading Jews to his capital. Half a century later it was the Persian King Cyrus who in his turn had overthrown the Babylonian empire. He had permitted the Jewish exiles to return to their homeland, and in a solemn decree had given them permission to rebuild their temple (Ezra 5:13; 6:1-5). But the majority of the Jews had preferred to stay in Babylon, where life was easier, and only a small number had returned. They had probably made a first beginning of rebuilding the temple, but the work was soon discontinued; there seemed to be more important things to be done.

Meanwhile the Persian emperor of Cyrus had died, his son Cambyses had committed suicide, and Darius Hystaspes had succeeded to the throne, whereupon a dangerous rebellion had broken out in Babylon.

In that turbulent time, in the year 520 to be exact, there arose in Jerusalem a man, the prophet Haggai, who exhorted his fellow citizens to get down at long last to rebuilding the ruins of the temple. He began his address with the following words:

Haggai 1:2-9:
(2) Thus says the Lord of hosts: This people say the time has not yet come to rebuild the house of the Lord. (3) Then the word of the Lord came by Haggai the prophet, (4) Is it a time for you yourselves to dwell in your paneled houses, while this house lies in ruins? (5) Now therefore thus says the Lord of hosts: Consider how you have fared. (6) You have sown much, and harvested little; you eat, but you never have enough; you drink, but you never have your fill; you clothe yourselves, but no one is warm; and he who earns wages earns wages to put them into a bag with holes.

(7) Thus says the Lord of hosts: Consider how you have fared. (8) Go up to the hills and bring wood and build the house, that I may take pleasure in it and that I may appear in my glory, says the Lord, (9) You have looked for much, and, lo, it came to little; and when you brought it home, I blew it away. Why? says the Lord of hosts. Because of my house that lies in ruins, while you busy yourselves each with his own house.

And indeed, his words had some success. Under the leadership of Zerubbabel, the Jewish governor appointed by the Persian king, and of the high priest Joshua, the people start the rebuilding. But it seems a hopeless task, for the new temple will never be as beautiful as the old one was. And so the people get discouraged and are tempted to stop the work again. Then Haggai delivers his second address:

Haggai 2:3-9:
(3) Who is left among you that saw this house in its former glory? How do you see it now? Is it not in your sight as nothing? (4) Yet now take courage, O Zerub'-babel, says the Lord; take courage, O Joshua, son of Jehoz'adak, the high priest; take courage, all you people of the land, says the Lord; work, for I am with you, says the Lord of hosts, (5) according to the promise that I made you when you came out of Egypt. My Spirit abides among you; fear not. (6) For thus says the Lord of hosts: Once again, in a little while, I will shake the heavens and the earth and the sea and the dry land; (7) and I will shake all nations, so that the treasures of all nations shall come in,

and I will fill this house with splendor, says the Lord of hosts. (8) The silver is mine, and the gold is mine, says the Lord of hosts. (9) The latter splendor of this house shall be greater than the former, says the Lord of hosts; and in this place I will give prosperity, says the Lord of hosts.

You are perhaps surprised that I have chosen this passage; it is not one of those central to the Bible, and the building of the temple is no longer of importance to us. But you have to realize that in Israel the temple stood for the presence of God; it made possible the cult which was the way given by God by which his people could approach him. So Haggai sees that in the rebuilding of the temple the very faith of Israel is at stake. But the people say that they have no time for it yet, that it has to wait until later. First things first – and the first things are of course the immediate and more pressing needs which have to be taken care of. The general reconstruction programme of the country has not gone according to plan. During the time of exile the Jews had thought of the restoration of Israel the fulfilment of all their dreams. Now the restoration had become a fact, but the hoped for happiness did not come. Understandably there was a terrible feeling of being let down, as expressed in the words: "You have sown much, and harvested little; you eat, but you never have your fill; you clothe yourselves, but no one is warm; and he who earns wages earns wages to put them into a bag with holes." Perhaps these words indicate a severe drought, which afflicted Israel with a serious famine, which in its turn caused inflationary prices. But I am more inclined to take them metaphorically, as suggesting that whatever material goods had been attained – and Haggai's remark that the people live in well-built houses seems to imply that they were no longer too badly off – did not give satisfaction, for they were never enough. "You have looked for much, and see, it came to little", expresses clearly the all-pervading atmosphere of malaise.

Haggai seeks to counteract this feeling by arguing that the people have turned things upside down. They are quite right to say that first things should come first, but they forget that the very first thing is God. Therefore the reconstruction programme must wait. Rebuilding a world without God cannot succeed; purely material welfare will never satisfy.

Haggai begins his second address by acknowledging the defeatist thoughts which came to the people when they saw the building activities. "Do you remember the temple in its former glory? How do you see it now? Is it not in your sight as nothing?" So speak the realists, those who stand on the side-lines, pointing out that the work in hand makes no sense. The realists on the sidelines are always very good at killing all enthusiasm. They do so where secular matters are concerned, but even more in matters of faith. They are quick to prove that anything faith tries to do is Utopian and unrealistic. And there is a general tendency to side with these so-called realists against the "Utopian unrealists". Therefore it is nice to see that once in a whole the Utopians are vindicated by history and proved to have been the greater realists. So it happened in this case. We have no description left of this rebuilt temple, and it is quite likely that it was indeed "as nothing" compared to that of Solomon. But its importance for the future of Israel can hardly be overestimated, because for centuries to come it was the rallying point of the Jews, who were no longer an independent nation. It welded them together, and so helped them to survive also later on when they had lost their land as well. Historically speaking, it is questionable whether there would today still be a Jewish people, if the temple had not been rebuilt.

Haggai could not know that, of course, but the rebuilding gave him an even wider perspective. He saw it in an eschatological light. In his second address he speaks of a shaking of the heavens and the earth, and of the nations who will come and bring their treasures to the temple. These are regular features of Old Testament descriptions of eschatological expectations. Another feature of these expectations is that they are often at one and the same time historical and metahistorical. In announcing a divine shaking of the nations, Haggai may well have had in mind the profound perturbations in the Persian world empire; but at the same time his words go beyond what can be expected in history.

Haggai is considered by many to be narrowly nationalistic and particularistic, but I believe that this does not do him justice. For he is not thinking primarily of the power of his people, but of the power of God. The nations will not bow down to Israel, but to the God of Israel. Nor is the judgement of the nations the ultimate goal to which he looks forward. The ultimate goal is that in and through the temple – symbol of God's presence – God will give "shalom". The RSV translation of this work as "prosperity" is much to flat. Even its translation as "peace" does not grasp the richness of the Hebrew word. "Shalom" is fulfilment, salvation, and not in an otherwordly sense, but salvation here in this world. As such it includes peace and prosperity and happiness. And I am convinced that the shalom of which Haggai speaks here had for him worldwide implications, though he does not say so explicitly.

How is it possible that Haggai saw the rebuilding of the temple in this wide perspective? Modern scholarship believes that the words of 2:5 – "according to the covenant which I made with you when you came out of Egypt" – are spurious. They are most likely a note, written in the margin by some reader, and later on accidentally put into the text by a copyist. But they offer a very apt commentary on the rebuilding of the temple: God is the God of the covenant, who has promised to be with his people and who is faithful for all time; therefore he will see to it that work done for his sake will not come to nothing.

What is in itself an unremarkable passage seems to me to be important especially for the following reasons:

1. The marked similarity between the situation to which it speaks and our own situation. We work for more and more possessions, but the more we accumulate the less they seem enough, and they run through our fingers without giving us real happiness. And Haggai would say: no wonder, because we are not focussed on God.

2. Haggai points to the very concrete, small next step which has to be taken. It is a ridiculously small step in view of the great problems that beset the Persian empire of Haggai's time, and that beset the world in our time. But to take this small next step is the only thing we can do. Therefore we had better take it even if the realists point out that it is as nothing, merely a pitiful drop in the bucket. As a matter of fact, we cannot even evaluate the importance of what we do, – as this passage of Haggai also shows.

3. And finally Haggai expresses the assurance that it is God who will fulfil our work. The connection between the rebuilding of the temple and the great future which God will give is not clarified in our passage. Only this much is apparent: that there is a connection between the *shalom* for the world which only God can give and the small next step which we can take.

> *Prayer:*
> God our Father, you know that we are always very busy with all kinds of things which we consider important, and that we never have time enough – and that anyway we have no time for you. Break through with your presence into the closed circle of our lives. Make us open to you, to one another, and to the world around us. Give us to trust you so that we may receive the necessary courage to face our human responsibilities and to make decisions. Show us the way which leads into your future, and give us open eyes to see the priorities and the possibilities before us. You do not ask of us more than we can do. Lord, be with us and with your world. Amen.

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III. LIBERATION FROM THE POWERS

"Modern technology creates a new kind of world." "It is a dehumanizing power." "It stimulates human desires." "Social structures resist rightful change." These are just a few quotations taken from the reports of *Geneva 1966* and *Uppsala 1968*. And a line from a newspaper: "The growing number of cars demands more and larger auto-routes." And from a woman's magazine: "Miniskirts can no longer be worn; fashion prescribes knee-length skirts this year." All these quotations have one thing in common: they speak of technology, traffic and fashion as personalized powers which are independent of man and which somehow manipulate us, instead of our controlling them. And when we think and speak of them in that way, we are mythologizing them, for we give them the status of quasi-persons.

These remarks may help us to understand Paul's toughts about what he calls the *stoicheia* in his letter to the Galatians. Galatia was a region in Asia Minor where Paul had founded Gentile churches. Afterwards had come missionaries, perhaps belonging to a sectarian Jewish-Christian group, who had persuaded the newly converted pagans to be circumcised and to observe scrupulously particular days and probably also the entire Jewish law. And now Paul writes them a letter to warn them that thereby they were actually negating the Christian faith.

> *Galatians 4:1-11:*
> (1) As long as the heir is under age, he differs in nothing from a slave, though he owns all the property; (2) but he is under guardians and trustees until the date fixed beforehand by his father. (3) So with *us;* when we were under age we were slaves under the "stoicheia tou kosmou". (4) But when the time was fulfilled, God sent forth his son, born of a woman, born under the law, (5) to redeem those who were under the law, in order that we might receive adoption as sons. (6) And to prove *that you* are sons, God sent the Spirit of his son into your hearts,

crying, "Abba, Father". (7) So you are no longer a slave, but a son, and if a son, also an heir, thanks to God. (8) But formerly, when you did not know God, you were slaves to gods who in their nature are no gods; (9) but now, knowing God, or rather known by God – how can you again turn to the weak and beggarly stoicheia, whose slaves you want to be all over again? (10) You observe days, months, periods and years. (11) You make me fear that somehow I have laboured over you in vain.

Paul makes here a sharp distinction between life before and after Christ. Before Christ there was servitude, and man was like a slave or a child under age; after Christ there is liberation and freedom, and man is like a son come of age. That former servitude was the condition of all men without exception, of the Jews, of which Paul himself is one and whom he refers to as "we"; and of the Gentiles, the "you" in this passage. For Paul this distinction between Jews and non-Jews is the one fundamental difference among men, and apart from Christ this difference is very great indeed. But in relation to this point of human servitude, it does not exist at all. True, the Jews were subservient to the Jewish law, and the Gentiles were idolaters who served gods who in reality are no gods. But they were equally subject to the "stoicheia tou kosmou".

It is on purpose that I have not translated these Greek words, which are rendered differently in various translations. The RSV and NEB translate them as "elemental spirits of the universe", the Zürcher Bible as "Naturmächte der Welt" (Nature powers of the world), and the French synodal edition 'les rudiments du monde" (the first principles of the world). This much at least is sure: the Greek word "kosmos" does not mean the same as our English word "cosmos", but means rather "world" as we use the word when, for instance, we say that we hope for a better world; and the word "stoicheia tou kosmou" should therefore be something like "elemental powers" or "elemental structures of the world". But the exact translation is not important, for the expression is coined by Paul as a kind of cryptogram to indicate certain forces, such as the Jewish law and pagan religion, and the human traditions and regulations which he elsewhere mentions as belonging to them (Col. 2,8).

1. The *stoicheia,* or powers, or whatever they should be called, are for Paul not something purely negative. In our passage he speaks of them as guardians and trustees. They order and structure life and form a more or less fixed pattern, in which life can be lived in a rather matter-of-course manner. It can be a pattern of thought, as offered by a religion, an ideology, or the way "everybody" thinks. It can also be a pattern of structure, as given by the nation, forms of society, or the *status quo.* All these fixed patterns give a feeling of stability and security, for they prescribe what man has to do and to think. But they also put a fence around man and hem him in on all sides. That is the price he has to pay for his security.

2. These stoicheia are conquered by Christ. In Colossians 2:15 we read that Christ disarmed the principalities and powers and made a public spectacle of them. Principalities and powers, like thrones, dominions, and rulers (Col. 1:16; Eph. 6:12) are all names used to designate mythological entities, which are identical or at least closely connected with what Paul elsewhere calls "stoicheia". That is to say, the stoicheia have no ultimate power and no final authority over men. But Paul can say this only in looking back upon them after having experienced the liberating force of Christ. Formerly they seemed very powerful indeed, so powerful that they could enslave man; only after Christ has unmasked them for what they are, has it become manifest that they are "weak and beggarly", as Paul contemptuously calls them (v. 9).

3. The *stoicheia* are a divisive force, separating man from man. The distinction between Jews and Gentiles is exemplary in this respect. Before Christ the Jews lived under the law and the Gentiles served their own gods, and there was a world of difference between them. At least so they thought – for serious matters of principle were concerned. But Paul, with a magnificent disregard for their own self-understanding, maintains that there was no real difference between them at all, for both lived in slavery. Where the stoicheia reign, they always make for division and enmity; remember how men hate each other for ideological reasons. And only after the stoicheia are unmasked, does man realize that there is not much difference between one form of them and another. But again, it is only Christ who unmasks them. Therefore only when men believe in Christ, do they know that the differences among them are not important; for in Christ there is neither Jew nor Greek (3:28).

4. Did Paul consider these elementary powers to be personal beings? It is not possible to answer this question with a straight yes or no. We know that the principalities, thrones, powers, etc., by which he denotes the "stoicheia" are derived from Hellenistic and Jewish thought, where they are the names used for different kinds of spiritual beings. But Paul is not interested in the various classes of spirits, angels, and demons, nor in their hierarchy, for he uses their

names haphazardly without any fixed order. In this way he thoroughly demythologizes them. Therefore let us beware; in speaking of technology and social structures as quasi persons and thereby mythologizing them, we may easily give the impression that they are our masters and that we are powerless before them.

5. Is Paul, speaking about the *stoicheia,* authoritative and relevant for us today? That is another question which cannot be answered by a simple yes or no. I would say that he has authority and relevance for us only insofar as we recognize our present-day world in his worldview. He had experienced the liberation which Christ had brought him. This liberation had given him new eyes; he saw men governed by all kinds of seemingly unmovable laws and traditions; he saw them living in awe and trembling and not as free men. So his message to them was: only God in Christ is your Lord, not these powers; realize that you have come of age. True, Paul did not know our ideologies and our various – "isms" – but are they very different from those former gods who in their nature are no gods? He did not speak of what we call the establishment – but he does remark that it was "the powers" which had crucified Jesus. (1 Cor. 2,8). And he certainly had nothing to say about the problems of technology we are dealing with at this conference. Or did he?

Prayer:
Lord, you have given us legs, not that we may crawl before you but walk before your face with our heads held high. Give us your Spirit that we may not misuse our liberty. Lord, sometimes we can become deadly afraid, when we see the demonic influence of the powers in the world; then we would like to become again little children, who hide with you. But you want us to be your free and grown-up sons and daughters. Help us to free the world of the demonic powers, in full assurance that the demons are nothing but false powers. Strengthen us in the knowledge that you are the only real power. Amen.

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IV. ULTIMATE VISION

In Haggai we saw the importance of the temple as the place where God was present. The same thought comes to the fore in a different form in the book of Ezekiel. Priest and prophet, he lived fifty years before Haggai, in a time when Israel was still in exile. The situation was hopeless: Jerusalem and its temple had been destroyed, the homeland was depopulated and plundered, and there seemed no future left. And then, in the year 572, Ezekiel tells of a vision he has had there in Babylon (Ezekiel 40). He is set down upon a very high mountain from where he sees the buildings of a city; there is an angel with a measuring-rod, who measures the city and who gives in great detail its dimensions and particularly those of the temple. In a second vision he sees how God, in a blinding, inaccessible light, comes into the temple.

There you have a man in exile, who in a dull way – merely by listing measurements – expresses his certainty that his people will be restored. He does so not in light of the historical situation, for, empirically viewed, there is no hope; but because of his belief in the faithfulness of God. And finally, in a last vision, he sees water trickling from under the altar through the temple gate, and it becomes a great stream, and it flows through the dry land into the Dead Sea, and the water of the sea becomes sweet, so that very many fishes live in it, and the desert becomes fertile, so that on the banks of the stream all kinds of trees grow. And "their leaves shall not wither and they shall bear fresh fruit every month, because their water comes from the sanctuary; their fruit shall be for food and their leaves for healing" (Ezekiel 47,12). That is Ezekiel's dream of the restoration of Israel and of Jerusalem, with at its centre the temple where God is present. And because of God's presence, life will be good again, in its outward form also, for there will be a stream of living water flowing through the land.

This dream was realized, and at the same time not realized. We saw in Haggai that the exiles did indeed return and that the temple was rebuilt – but the dreamed-of future did not come and life did not become full and good. And after a few centuries the people were again expelled, the city again destroyed, and its temple pulled down, and shortly the land became again desert or dismal swamp.

Fifteen or twenty years after the final destruction of the temple, that is, six centuries after Ezekiel had dreamed his vision, his words were taken up by the author of the book of Revelation, a man called John. This book belongs to the so-called apocalyptic literature, a kind which flourished around the beginning of the Christian era, and which described the course of world history and its end in visionary, often bizarre pictures. John wrote his book to encourage a small, powerless group of Christians, who were scared because of the threat of persecution by the Roman emperor. The climax of his book is the well-known words in which the author describes his vision of ultimate fulfilment.

Revelation 21:1-4:
Then I saw a new heaven and a new earth; for the first heaven and the first earth had passed away, and the sea was no more. (2) and I saw the holy city, new Jerusalem, coming down out of heaven from God, prepared as a bride adorned for her husband; (3) and I heard a great voice from the throne saying, "Behold, the dwelling of God is with men. He will dwell with them, and they shall be his people, and God himself will be with them, (4) he will wipe away every tear from their eyes, and death shall be no more, neither shall there be mourning nor crying nor pain any more, for the former things have passed away."

Then there is an angel with a measuring rod of gold – not of flax, as in Ezekiel – who measures the city, which is of pure gold, with twelve gates each a single pearl, and a wall with twelve foundations of precious stones. And then the description goes on:

Revelation 21:22-27:
(22) And I saw no temple in the city, for its temple is the Lord God the Almighty and the Lamb. (23) And the city has no need of sun or moon to shine upon it, for the glory of God is its light, and its lamp is the Lamb. (24) By its light shall the nations walk; and the kings of the earth shall bring their glory into it, (25) and its gates shall never be shut by day – and there shall be no night there; (26) they shall bring into it the glory and the honor of the nations. (27) But nothing unclean shall enter it, nor any one who practices abomination or falsehood, but only those who are written in the Lamb's book of life.

And the end of the vision is:

Revelation 22:1-2:
Then he showed me the river of the water of life, bright as crystal, flowing from the throne of God and of the Lamb (2) through the middle of the street of the city; also, on either side of the river, the tree of life with its twelve kinds of fruit, yielding its fruit each month; and the leaves of the tree were for the healing of the nations.

It is evident that the author has made extensive use of Ezekiel, but he has also taken words and sentences from other Old Testament passages. As a matter of fact, there is no other book in the New Testament that relies as strongly on the Old Testament as does Revelation, and there is perhaps no other chapter of Revelation in which so many different Old Testament quotations are found as in our passage. To give only a few examples: the concept of a new heaven and a new earth is taken from Isaiah 65:17; the words, "God will wipe away all tears", are a quotation from Isaiah 25:8; the thought that there will be no more night and that the wealth of all nations will be brought in is found in Zechariah 14 and Isaiah 60. There is practically no sentence or thought which does not have its counterpart in the Old Testament. It is as if all former hopes and expectations are taken up, to be fulfilled in the grand finale which John describes.

Our passage speaks by and large for itself; therefore I want only to make a few points.

To describe the new earth, the image of a new Jerusalem come down out of heaven is used. The ultimate hope is not that man will go to heaven, but that heaven will come on earth. Note also that it is the image of a city that is used as a symbol of the final fulfilment which surpasses all understanding. One might say that history, as the Bible sees it, goes from the garden at the beginning to the perfect city at the end. In our study of Genesis 4 we observed that the city is not evaluated negatively; that is confirmed in the verses here: the city is not something bad or demonic, not a

"power" which in the end has to be conquered or will be left behind. On the other hand, this new Jerusalem is not a city as we know it, for it is in all respects a perfect city, as indicated by its form of a tremendous cube, symbol of perfection, and by the number twelve, the perfect number. And this perfect city is a perfect society in which there is full happiness – for there will be no more tears or mourning or pain; and full peace – for the gates will always be open; and full unity of mankind – for the city will not only be for the sons of Israel, but the nations also will freely come to it. All the treasures of culture will be there – for the nations and their kings will bring into it all what has made them famous. And above all, there will be full immediacy between God and man – for the temple will be no longer necessary. It is this immediacy which makes all life good, and even nature with its river of living water and its life-giving trees shares in this goodness. In the ultimate fulfilment all problems of the earth are solved, all human longings are realized, and all earthly blessings which we know are taken up and intensified.

Why should we believe it? There is no reason on earth, except the reason John had for not discarding the Old Testament dreams, which had all come to nothing, and for taking them over and making them all-embracing. And the reason for John was Jesus Christ. He did not say – as the Church after him has all too often said – that Jesus Christ had fulfilled all hopes and expectations. Christ was for him not the fulfilment but the pledge of God's love and God's power and trustworthiness. We have not the slightest reason to believe that the biblical expectation of an ultimate goal of history, of an ultimate goodness of existence, is not mere illusion and a projection of our wishes – except that we too know and have experienced something of God and of his love for man, and therefore believe that that love is too great for him to leave his creation to destruction and annihilation.

In the book of Revelation this ultimate fulfilment is seen as purely the work of God, and the work of man does not enter into it at all. That certainty was a consolation for those early Christians who were entirely powerless to do anything except to hold fast to their faith – and perhaps that was the most powerful act imaginable. But many smaller dreams have gone into the dream of ultimate fulfilment. All the dreams of Ezekiel, Isaiah, Zechariah, and the other Old Testament writers were not negated but confirmed when they were taken over. In the light of the all-embracing dream of John, these other dreams appear to be smaller and only partial ones. But man does not live only by his dream of ultimate fulfilment, but also by the coming true of his smaller, penultimate dreams. The last things are – thank God – taken out of our hands. But there are also – thank God – things before the last things. In the knowledge that the last things, the ultimate goal of history, are not in our power, we are set free to work for relative goals. These relative goals and these smaller dreams stand in the light of the last things. We cannot build the perfect society – but in the light of the new earth we can perhaps build a society in which there is a little bit more happiness, and in which peace and the unity of men are a little more realized. We cannot do away with death, but we can give some comfort and ease in suffering, and we can make dying a little bit more humane. We cannot build God's Jerusalem, with its streets of pure gold like translucent glass, but we can perhaps make our cities better places to live in, with streets in which children and old people and foreigners can safely and pleasantly walk.

Prayer:
God our Father, we turn to you with all our human knowledge and with all the human power we have – and with all our poverty. We cannot solve the ultimate problems of our world. We bring before you the sufferings of mankind: the strife among the nations, the unnecessary bloodshed and violence – in Ireland, in the Middle East, elsewhere. We bring before you the hunger of a great part of the world – the injustice inflicted by man upon man.

You love mankind more than we do, and you can take better care of it than we can. Fulfil the work you have begun. And make us your instruments and cooperators, that also in our lifetime and in the lifetime of our children a few penultimate hopes and expectations may come true.

Lord, make your work manifest and establish the work of our hands upon us. Amen.